ENGINEERING
NEWS-RECORD

Tollroads: Has the boom busted? *p. 21*

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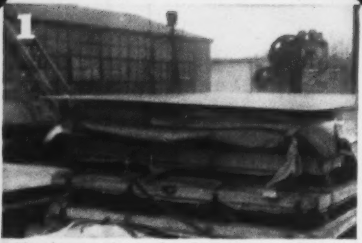
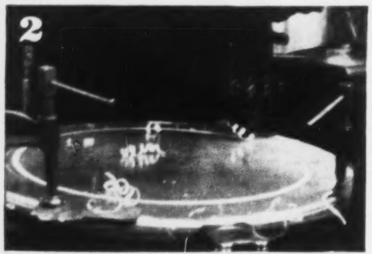
Steps to a CB&I built Aluminum Tank

• These photographs show some of the operations necessary to fabricate and erect six aluminum tanks, 17 ft. in diam. by 17 ft. 9 in. high. They were built by Chicago Bridge and Iron Company for the Carbide and Carbon Chemical Corporation at Institute, West Virginia.

CB&I is a leader in the field of specialized welded plate structures with more than 65 years of experience. Their four plants have complete facilities for designing, fabricating and erecting steel and other metal plate structures to the most exacting requirements. When you plan . . . plan with CB&I. Write our nearest office for further information.

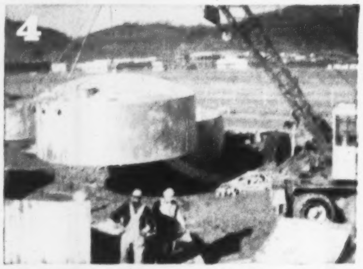


Aluminum plates in the plant receiving yard. From here, they go to the layout shop for marking from templates and are then trimmed to size.



In the shop the aluminum plates are rolled to the required shape and fittings and connections are machined to the proper dimensions.

This view inside the tank shows the lower ring of the shell being welded to the aluminum bottom.



Above: The top ring, roof and fittings, after being welded together are lifted into place as a unit.

Below: Field erection is complete and the tanks have been inspected and tested.

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CREEDMORE STATE HOSPITAL — Distressed Patients' Building — *Architect:* Cornelius J. White, New York; *Steel Fabricator and Erector:* Grand Iron Works, New York.

THE hospital buildings shown on this page are in New York City. Above is one of two new buildings for distressed patients, part of Creedmore State Hospital, situated at the intersection of Grand Central Parkway and Cross Island Parkway in Queens. These buildings have frameworks of Bethlehem Structural Shapes. In the Bronx is the 13-story East Bronx General Hospital, shown at right, the brick exterior of which covers a framework fabricated with Bethlehem Structural Shapes.

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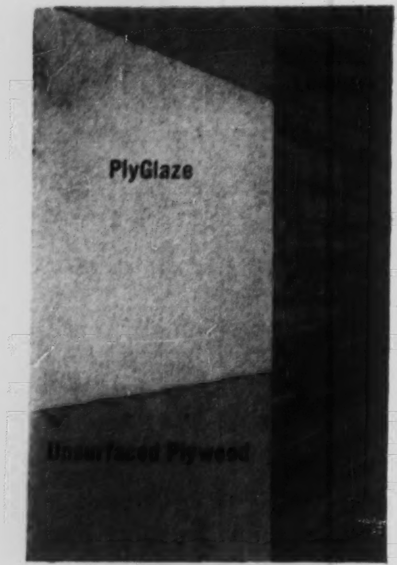

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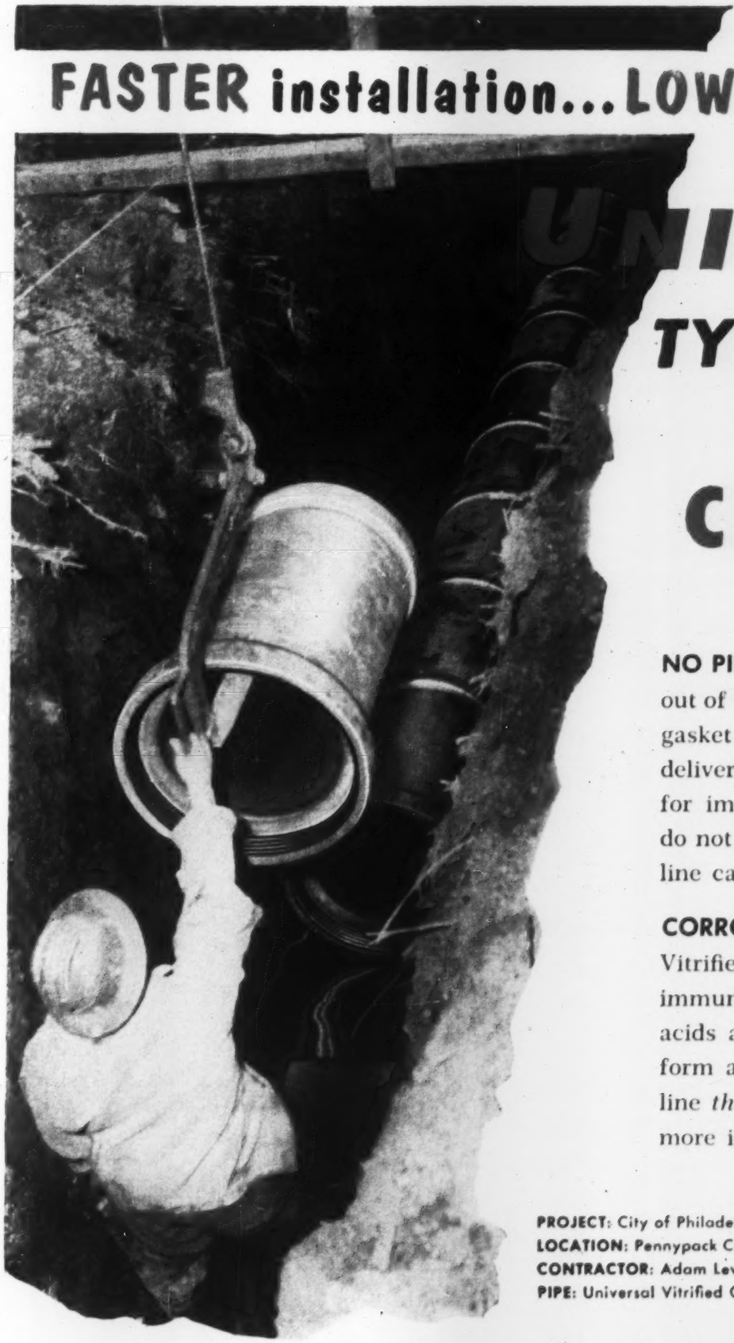

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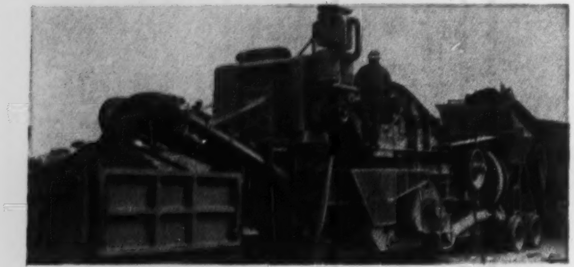
When Clark & Sons Sand & Gravel Company switched to a GM 2-cycle Detroit Diesel properly engineered for this dredge, production jumped more than 200% and fuel costs dropped one third. GM Detroit Diesel weighs half as much as engine it replaced, starts easier, too.



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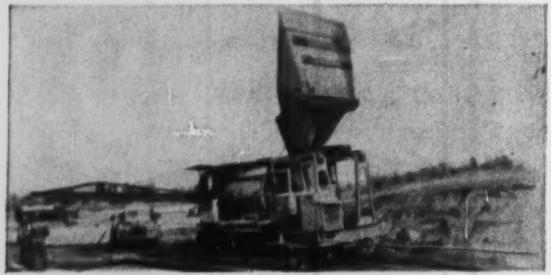
And that's "mighty cheap" for a 300-H.P. engine according to Charles Bartelma, Superintendent of Minnesota's Kimmes Construction Company. This GM Detroit Diesel-powered Cedarapids crusher produces 4,200 tons of gravel a day—engine has had no repairs in 2½ years.



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When Calumet Paving Company switched to a GM Detroit Diesel on this paver they got an engine that "starts easier, performs better, costs less for fuel and maintenance." Company also operates two other pavers and three crawlers—all GM Detroit Diesel-powered.

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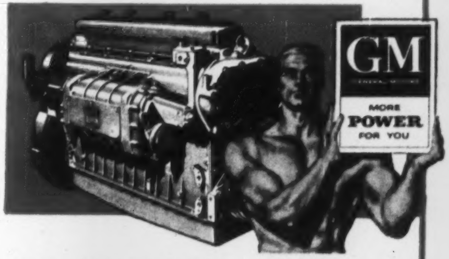

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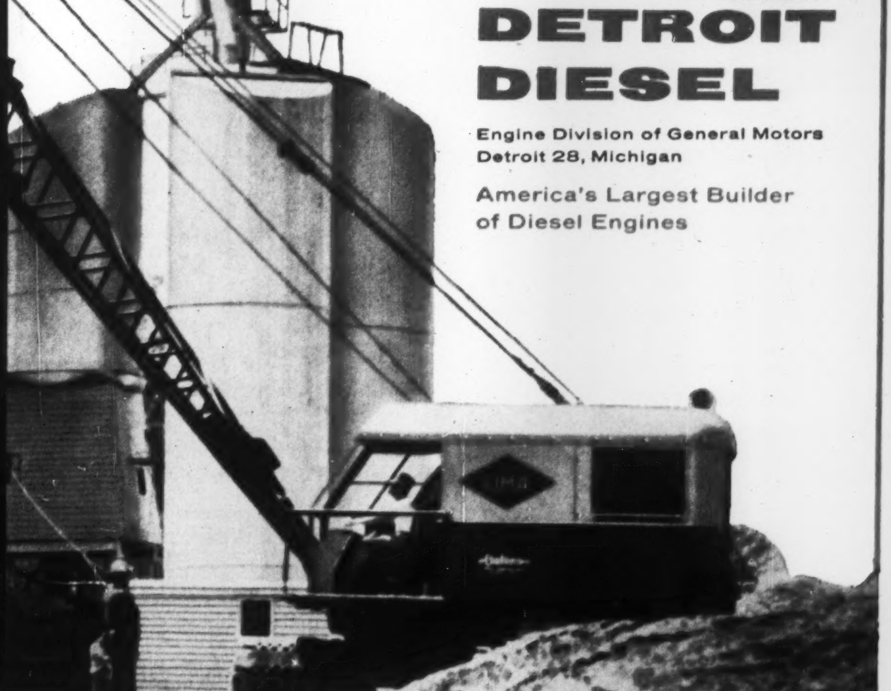

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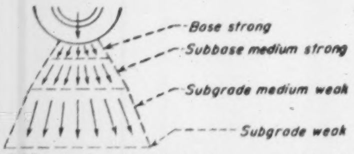

FIG. 1—Load distribution assumed in flexible-pavement design varies with the strength of the underlying strata.

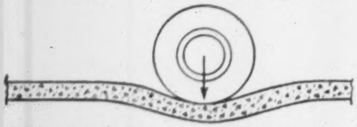

FIG. 2—Rigid pavement is assumed to dimple under a wheel load. The softer the subgrade, the bigger the dimple and the flexural stress.

Pavement Design Data Needed

Sir—Many road engineers have a feeling that there is a crying need for data which will aid them in making a balanced design of rigid and flexible pavements so that they might be more readily able to reduce the problem to one of economics—at least to arrive at a relative first cost in the balanced designs.

Selection of pavement thickness to date has largely been based on two widely divergent methods; namely, California bearing ratio for flexible pavements and Westergaard formula for rigid pavements.

As is generally known, the CBR is a comparison of the penetration of a plunger into a soil under consideration with that of the same plunger in a standard base stone layer. This gives an indication of the slope of the core of distribution for the intensity of stress carried down from the pavement to the subgrade (see Fig. 1).

In the case of the Westergaard formula, the plate load test determines the so-called *K* value, which is supposed to give an inkling of the bridging power of the concrete slab to distribute the wheel load to the subgrade. In other words, as the wheel passes over the slab, there is a deflection of the slab. The span of the resulting dimple determines the amount of flexural stresses and consequently the required thickness of the concrete pavement (see Fig. 2).

Obviously, these two methods are very far apart. They have led to unsatisfactory results in arriving at balanced designs.

There is now a strong drift toward empiricism in the determination of balanced designs. This is particularly so in the case of the proposed National Test Road sponsored by AASHO, where identical strips of flexible and rigid pavements are to be built side by side.

The following table shows a yardstick which might be used for design.

Yardstick for Pavement Thickness

(By Formulas)

Flexible Pavement Thicknesses—In.

Calif. Bear'g Ratio	8-Ton Wheel Load	6-Ton Wheel Load	4-Ton Wheel Load
5	21	18	15.5
15	10.5	9	8
25	8	6.5	5.5
50	7.5	5.5	4.5

Rigid Pavement Thicknesses—In.

Mod. of Subgrade Reaction	8-Ton Wheel Load	6-Ton Wheel Load	4-Ton Wheel Load
140	8.5	7.5	6
230	8.25	7.25	5.75
280	8	7	5.5
500	7.5	6.5	5.25

It presents 12 conditions to cover the field, between which other points could be interpolated. This table, however, is based on the CBR and Westergaard formulas.

What is needed are:

1. A table similar to this, arrived at on an empirical basis.
2. Tests based on the same subsoil, with parallel flexible and rigid strips.
3. Designs for twelve or more conditions—made with the best information available, and then after being tested, unless they proved balanced, the pavements should be reconstructed with variations in depth until a balanced bearing capacity is obtained.

It will then be possible for an engineer to use the results of a similar table based on this empirical approach as a ready yardstick for determining the economics of a balanced design. We are informed that the imminent WASHO and AASHO tests are a trend in the direction of the above suggestions, but in the case of the WASHO tests, identical parallel strips of rigid and flexible pavements are not

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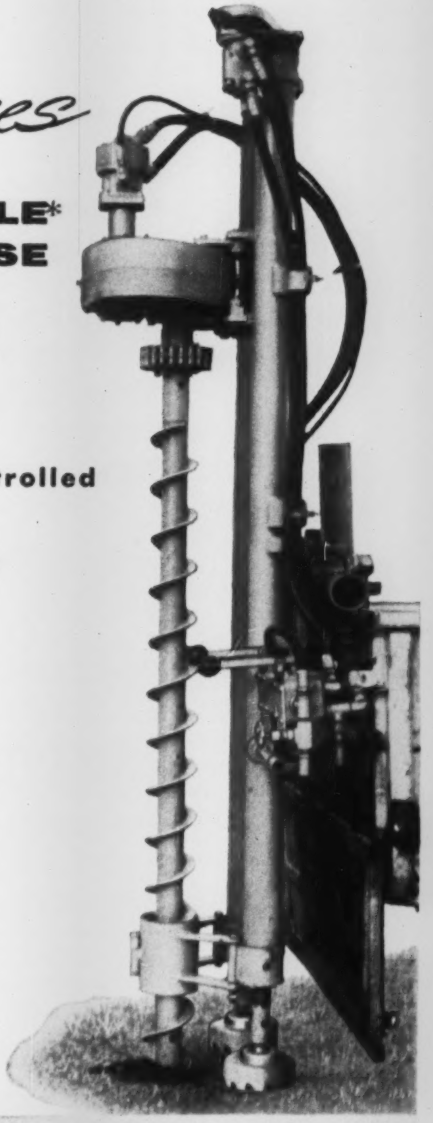

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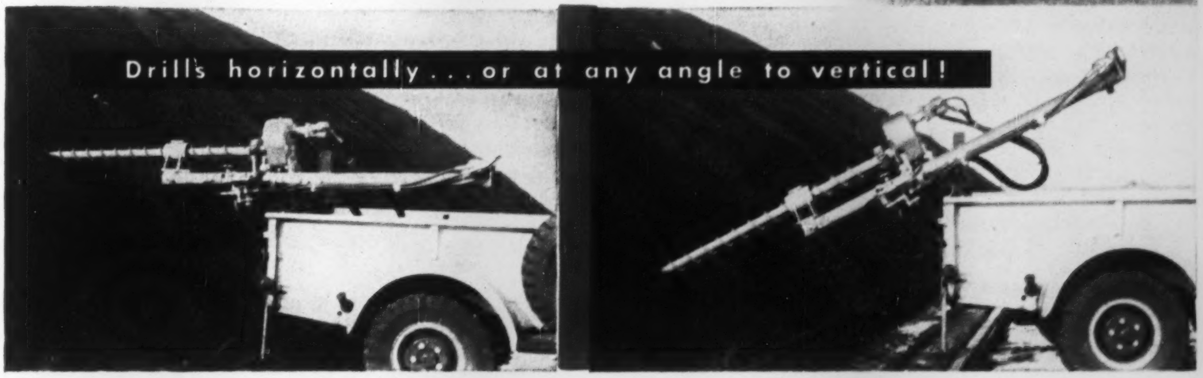

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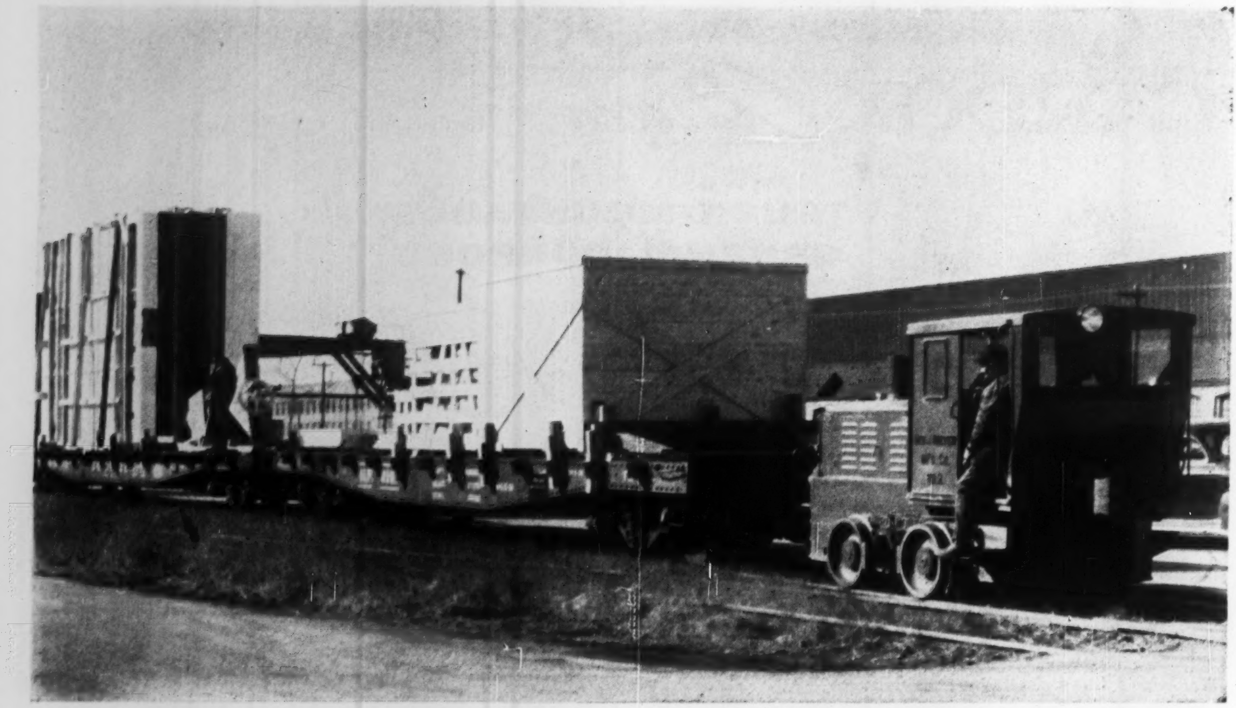

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ALSO BUILDERS OF F-R-H CERAMIC MACHINERY being carried out, and in the case of AASHO, item 3 is not being implemented.

Getting back to the table, it is interesting to speculate on the probability of correct relativity. For instance, does it appear probable that a 8¼-in. thickness of concrete would be equivalent to a 10¼-in. flexible pavement? The table also shows in the case of the high CBR's, a thinner flexible pavement than a concrete pavement.

The writers are bringing up these points as a probable doubt, to emphasize the necessity of complete empiricism.

E. E. SEELYE
WILLIAM BAILEY
ROBERT THACKABERRY
Seelye Stevenson Value & Knecht
New York, N. Y.

Welding to Save Steel

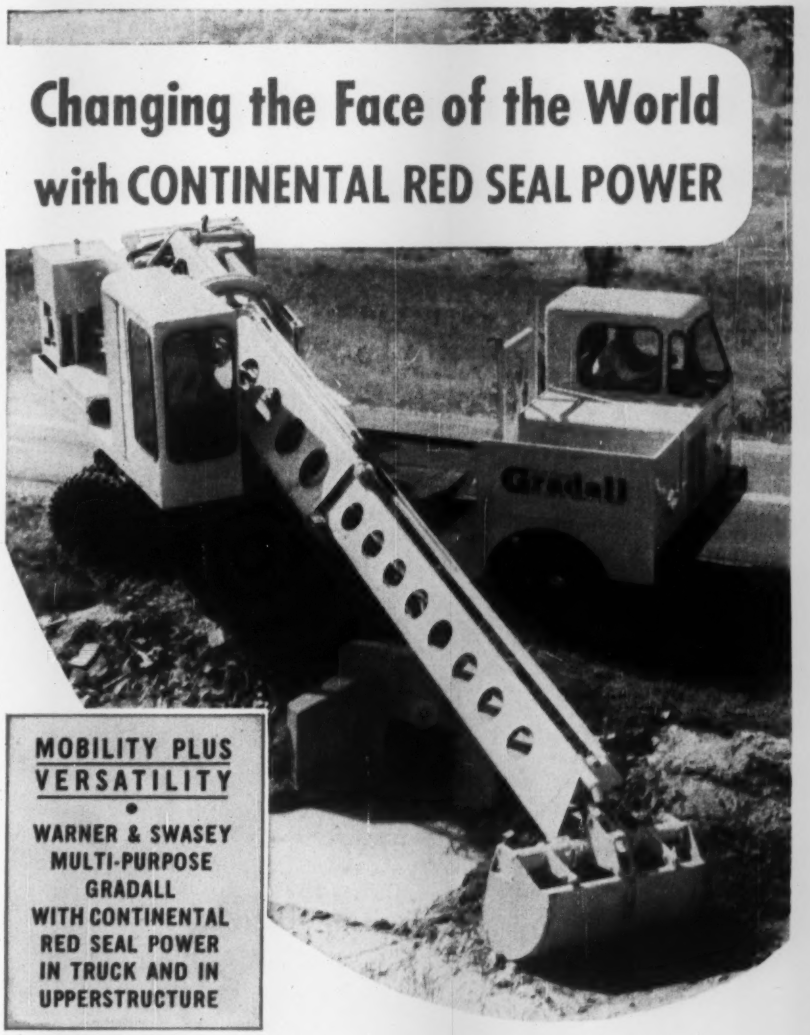
SIR—To an engineer who has been designing steel and reinforced concrete structures since 1905, your article "Record Demand Will Prolong Shortage" (structural steel), ENR March 15, p. 21, is interesting and, undoubtedly, must be enlightening to young practicing engineers.

Through years of experience, I have always preferred the structural steel frame to other methods, because I have found less or practically no engineering trouble develops from its use as compared to experience with other methods of building structural frames.

I presume everyone understands that the primary shortage of rolling-mill capacity, which has been increased but little in the past thirty years, is the background cause for this lack of structural steel; for, seemingly, the mills have been most shortsighted about increasing their structural shape capacity to keep up with the growing demand. Here in Baltimore, we have fabricating shops working on a half-capacity basis because they are on an allotment basis to get mill steel, which is not even promised to them for delivery in less than six to twelve months. What engineer is going to design a steel frame structure under these conditions, when he knows his client is in a hurry?

True, as you say, the rolling mills are making efforts to increase their structural capacity; so maybe in two or three years, as you indicate, we will get more structural steel. In the meantime, are we engineers who want to use structural steel just supposed to sit by and wait eight months to a year for our jobs to be fabricated, with our owners yelling at us because we

(*Continued on page 14*)



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MOBILITY PLUS VERSATILITY
•
WARNER & SWASEY MULTI-PURPOSE GRADALL WITH CONTINENTAL RED SEAL POWER IN TRUCK AND IN UPPERSTRUCTURE

Wherever you go these days, you see men at work re-shaping the landscape with the aid of modern construction machines. And no matter what the specific job—clearing land, ditching for irrigation, grading for railroads and highways, laying pavement or wrecking buildings—you'll note a pronounced swing, of late, to equipment with Continental power. The adoption of dependable Red Seals—gasoline or Cushioned Power Diesel—by more and more builders of construction and industrial equipment, reflects a spreading recognition, on the part of machine users, of this basic fact: There's a vast difference, in performance, dependability, economy and upkeep cost, between the ordinary engine and the Continental Red Seal that's engineered and built for the job.

•

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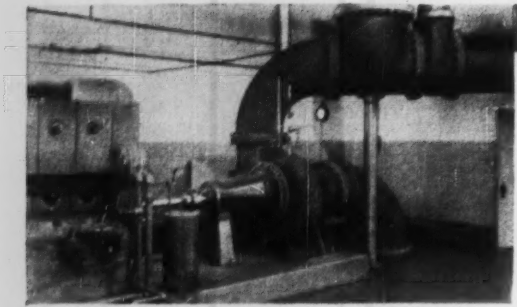
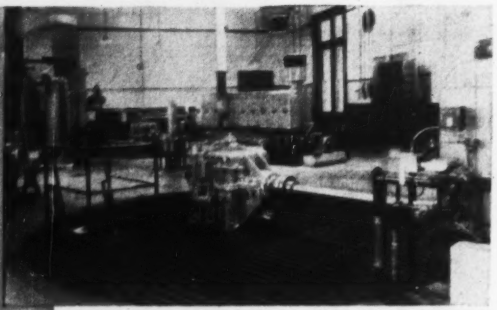
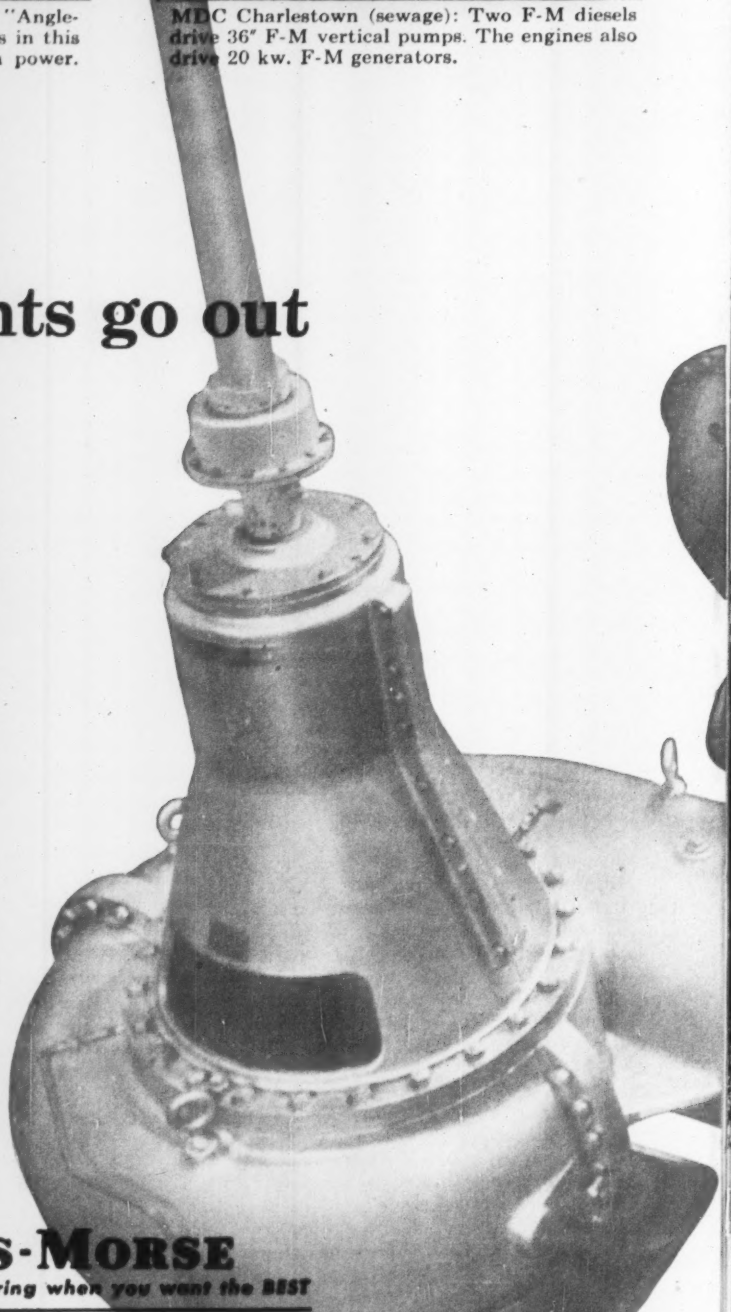


MDC Quincy (sewage): Twin 20" F-M "Angleflow" pumps are driven by F-M diesels in this station recently converted from steam power.



MDC Charlestown (sewage): Two F-M diesels drive 36" F-M vertical pumps. The engines also drive 20 kw. F-M generators.



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...MDC keeps pumping. MDC is the Metropolitan District Commission, an organization which exists to provide coordinated municipal services, parkways and recreational facilities for Boston and many of the cities and towns which are integrated in the metropolitan area.

Many of MDC's water and sewage pumping stations are completely self-sufficient. Others, dependent for normal service on utility electric power, have stand-by power of their own—just in case the lights go out.

Fairbanks-Morse has supplied the driving as well as the driven member in many MDC installations. F-M diesels drive F-M pumps in continuous service. Other F-M pumps are driven by F-M motors. Still others, diesel powered, are standing by for the possible emergency.

Whatever your problem in municipal pumping, Fairbanks-Morse has the pump . . . and the driver . . . and the engineering to solve it. Fairbanks, Morse & Co., Chicago 5, Illinois.

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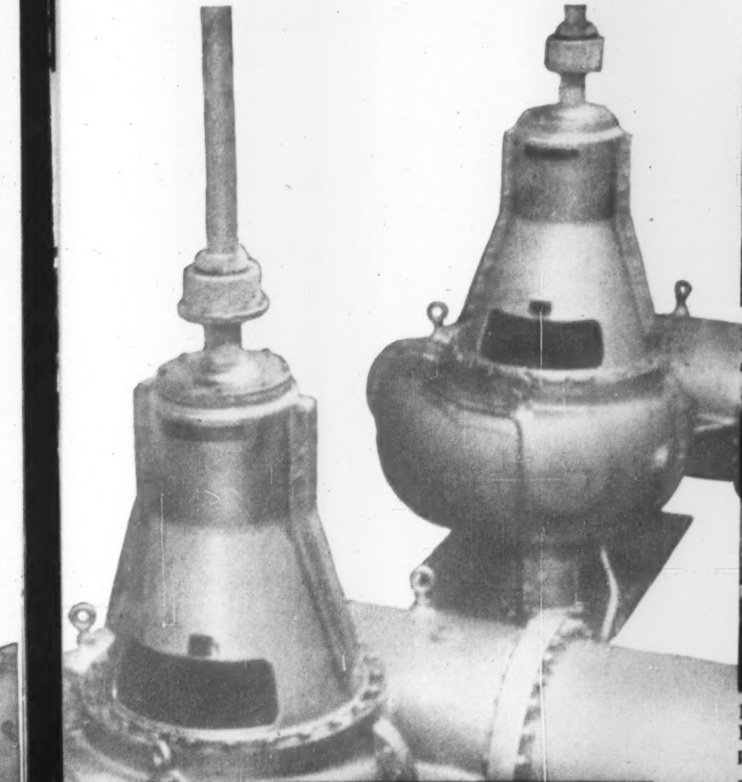
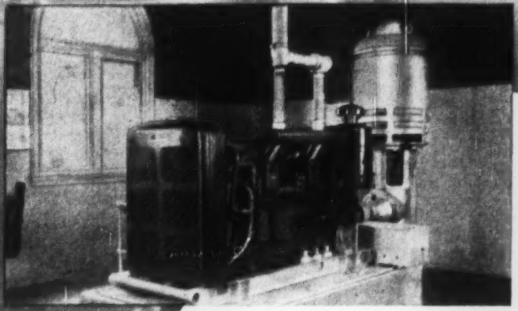
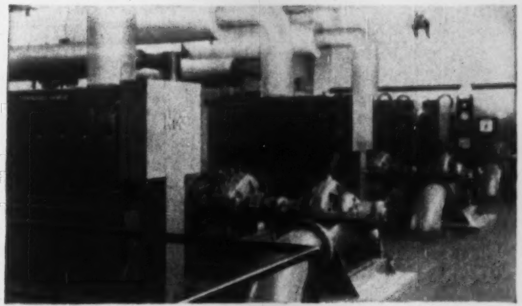




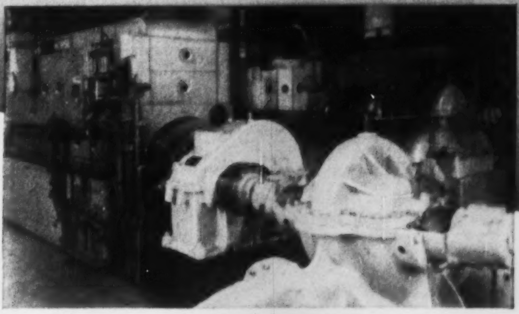
MDC Reading (sewage): In this two-pump (F-M) station, an F-M diesel can take over in the event of power failure to the 100 hp. F-M electric motor.

MDC Alewife Brook (sewage): In this new all-electric pumping station, two 36" and one 16" F-M "Angleflow" pumps are motor driven from the floor above.

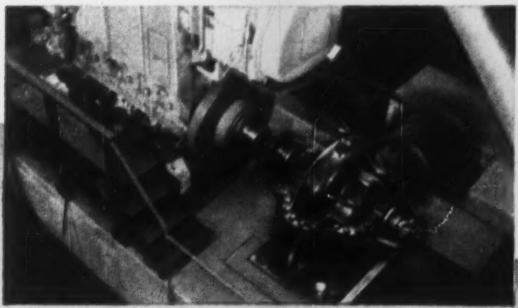


MDC Brookline (water supply): The new station on Newton Street houses three F-M centrifugal pumps and three F-M diesel engines.

MDC Waltham (water supply): F-M pumps and F-M motors fill routine demands. A third pump, powered by an F-M diesel, stands by for emergency.



MDC Arlington (water supply): In a station recently converted from steam power, Fairbanks-Morse centrifugal pumps are driven by F-M diesels.



MDC Spot Pond (water supply): A 20" F-M centrifugal (illustrated) and a 36" F-M turbine, driven by F-M diesels, are taking over from steam.

No matter what the pipe in your water distribution system

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offer simplicity of design, trouble-free operation and enduring service. From the engineering drawing boards through all stages of manufacture, they are step by step a truly "finished" product of workmanship. These factors, added to personal experience, are reasons why progressive water works men have relied on Eddy Valves for years. Available with bell, mechanical joint or flanged connections.

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WATERFORD, NEW YORK

used steel when there was really nothing equally as good we could have used?

I believe, after nearly thirty years experience with welded structures, that they offer an answer to the present situation. We have designed over 1,500 structures in which we used welding. None of these structures failed to save over 10% of the steel required by other methods of assembly.

These welded structures save steel required for connections, and make possible, through design methods, savings in beam and girder tonnages as high as 30% to 40%. Due to simplicity of connections, this type of work is easy to shop fabricate and erect, and we have found the steel can be purchased for the same ton price as other types of fabricated steel.

Studies we have made indicate that if even 80% of our structures were weld fastened, we could expect a yearly saving of at least 250,000 tons of rolled steel shapes from our present mill capacity, which could be used to help in the construction of much additional work from present rollings.

Just think what that would do in the present situation, for, as you note in your article, present fabricating capacity runs around 200,000 tons per month. In a year's time fabricators could catch up with the demand for their shop work, which is easier with welded fastening. So even though they have a larger number of pieces to handle, they can keep up with the mills, who would have this additional 200,000 tons of structural to supply to keep the fabricators busy with more jobs to do.

I can assure you this is no dream but the result of careful study, so if the designing engineer wants to help himself, at the same time helping everyone else, this is one way he can do it.

Van Rensselaer P. Saxe
Consulting Engineer
Baltimore, Md.

Support for Saville

Sir—We read with much interest your article in ENR Mar. 22, on Dean Saville — Engineering's Self-Analysis. The objectives seem to cover rather thoroughly what is greatly needed by the engineering profession. It also seems that Dean Saville's experiences in education and in practical engineering work will aid him in his new project. He seems to have the courage and the scientific attitude necessary to make an honest survey.

We hope that you will keep your readers informed to the progress of this survey.

Now that this survey is started, it is necessary that all engineers get behind Dean Saville and make the project a success. There are a great many men, organizations, and possibly corporations who may try to dominate this survey for their own selfish interests. It is necessary that engineers as a whole see that this is not done. What is needed is a scientific investigation and let the chips fall where they may.

E. R. Shelley
O. B. Trout
Minneapolis, Minn.

CALENDAR

American Water Works Association, Diamond Jubilee Conference, Kiel Auditorium, St. Louis, Mo., May 6-11.

Sixth Highway Transportation Congress, Hotel Mayflower, Washington, D. C., May 8, 9 and 10.

Society of American Military Engineers, 36th annual meeting, Washington, D. C., May 14-15.

Purdue Industrial Waste Conference, Purdue Memorial Union, Lafayette, Ind., May 15-17.

American Institute of Architects, annual convention, Biltmore Hotel, Los Angeles, Calif., May 15-18.

Prestressed Concrete Institute, second annual convention, Hollywood Beach Hotel, Hollywood, Fla., May 16-18.

Society for Experimental Stress Analysis, spring meeting, William Penn Hotel, Pittsburgh, Pa., May 16-18.

Building Research Institute, annual meeting, Sheraton-Brock Hotel, Niagara Falls, Ont., May 21-22.

National Society of Professional Engineers, Ambassador Hotel, Atlantic City, N. J., May 23-26.

Concrete Reinforcing Steel Institute, annual meeting, The Greenbrier, White Sulphur Springs, W. Va., May 28-June 2.

Steel Joist Institute, annual meeting, The Greenbrier, White Sulphur Springs, W. Va., May 29-30.

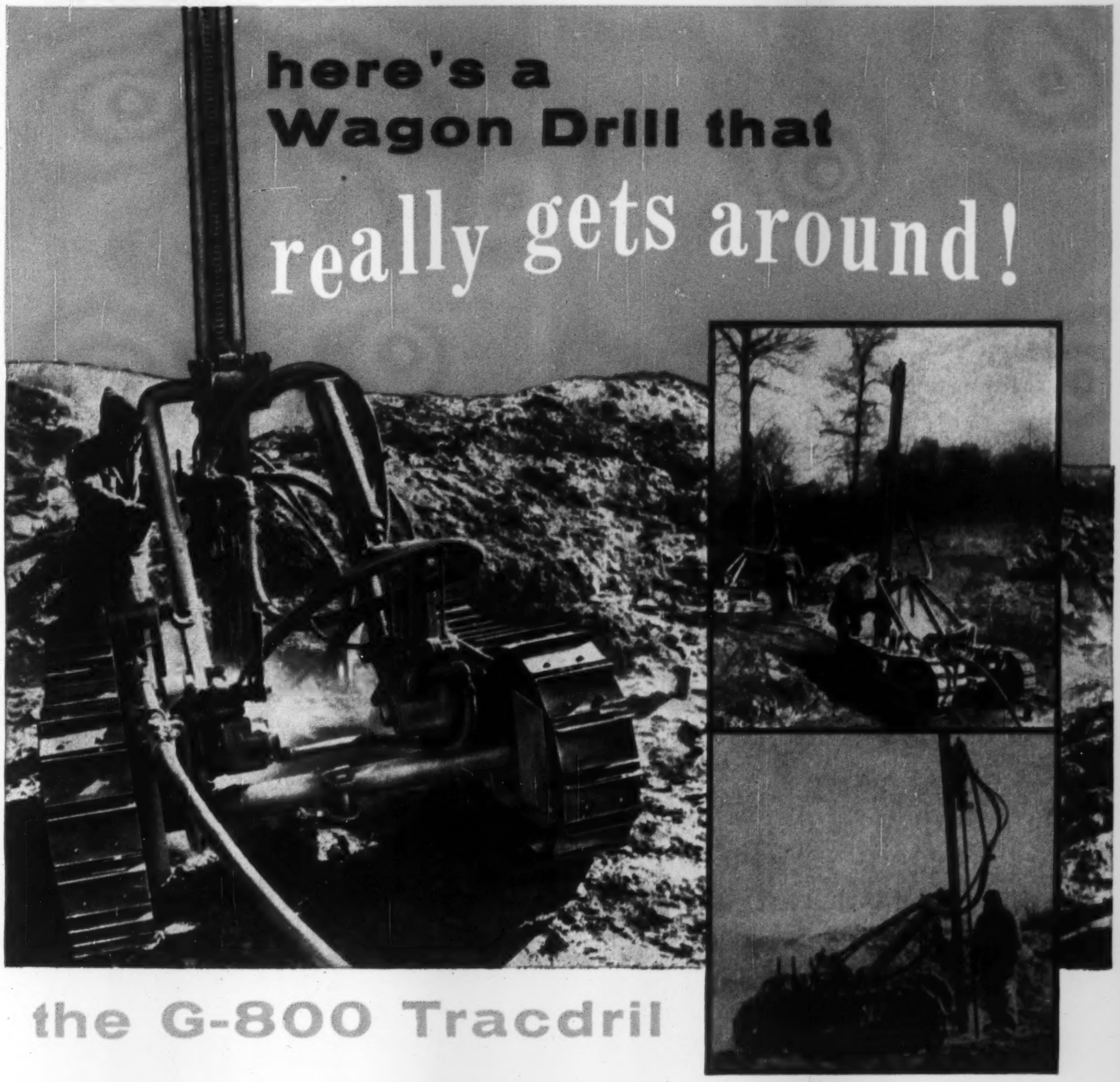
American Society of Civil Engineers, Spring convention, University of Tennessee, Knoxville, Tenn., June 4-8.

Materials Handling Exposition, Cleveland, Ohio, June 5-8.

World Conference on Earthquake Engineering, University of California, Berkeley, June 12-16.

American Society for Testing Materials, annual meeting, Chalfonte-Haddon Hall Hotel, Atlantic City, N. J., June 17-22.

American Society of Landscape Architects, 57th annual meeting, Cleveland Hotel, Cleveland, Ohio, June 24-27.



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the G-800 Tracdril

- Self-Propelled
- One-man Operated
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Combine the drilling speed of the hard-hitting CP-70NDC Drifter with the adaptability of a CP Drill Carriage and U-arm . . . add the maneuverability of a self-propelled track-mounting that tows its own air supply over rough terrain . . . and you have the One-Man CP Tracdril.

Reversible tramming motors enable the Tracdril to go forward, backward and pivot . . . for faster "moving time" from hole-to-hole, more accurate spotting and more time for productive drilling. "Knee-action" tracks keep the hydraulically operated U-arm support level when operating on uneven ground. The Tracdril has plenty of reserve power . . . can tow a 13,000 pound CP 900 c.f.m. Rotary Compressor up a 10% grade. For details see your CP equipment distributor.

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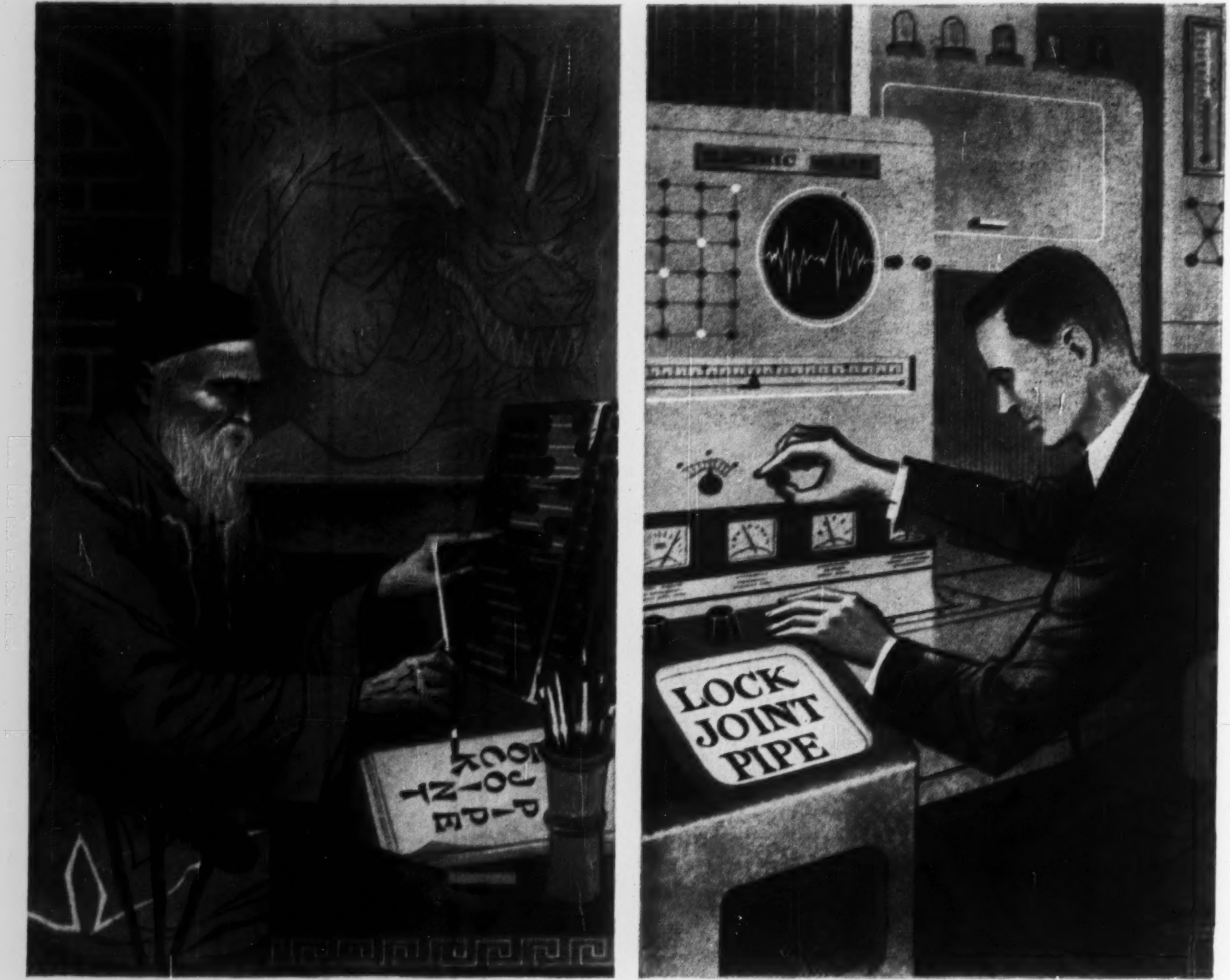

NO MATTER HOW YOU FIGURE IT...

When you undertake the purchase of a new pipeline for your water supply system, do you figure from the financial angle—low first cost, economical installation and a long life for your investment?

Or are you more interested in the construction of the line—minimum excavation, easy assembly, and watertight joints in a pipe strong enough to withstand high pressures and heavy external loads?

Then, again, your specialty may be maintenance. In that case you probably figure minimum repairs through freedom from breaks and leaks to be of paramount importance.

Or is your main concern with operation? If so, you no doubt figure permanent high carrying capacity, low pumping costs and trouble-free service to be vital.

Still, *no matter how you figure it*, your best answer will always be LOCK JOINT CONCRETE PRESSURE PIPE, because it most nearly approximates the ideal pressure pipe for water works systems.

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ENGINEERING NEWS-RECORD

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THE CONSTRUCTION WEEK

A GOLDEN SKYSCRAPER—A 34-story office building to rise in midtown New York has been designed with a gold exterior. A new-type of gold-finished extruded aluminum will be used for the building's mullions; while spandrels will also be of extruded aluminum but of a duller coloration. Base of the structure will be of pearl gray granite and stainless steel. Demolition of 10 buildings on the 32,500 sq ft site at the corner of Lexington Ave. and 51st St. is underway.

ADD TO SEAWAY AMBITIONS—The Detroit Planning Commission is seriously considering a proposal for a $20-million port development, capable of accommodating 30 to 40 ocean-going vessels, in the Delray section fronting the Detroit River. The project city planners have in mind also would occasion slum clearance action on some 140 acres of sub-standard housing.

JOB OPENING—Apparently the field is wide open for the $18,000 post of heading California's newly authorized Water Resources Department (ENR April 19, p. 29). Says Gov. Goodwin J. Knight: "I am looking for a man who not only is an administrator but who has sufficient engineering training so that he can tell instantaneously, without consulting his staff, whether technical information which comes before him is correct or not." Although a working knowledge of the state's complicated water problems is considered a prerequisite, the governor says his appointee will not necessarily be a Californian.

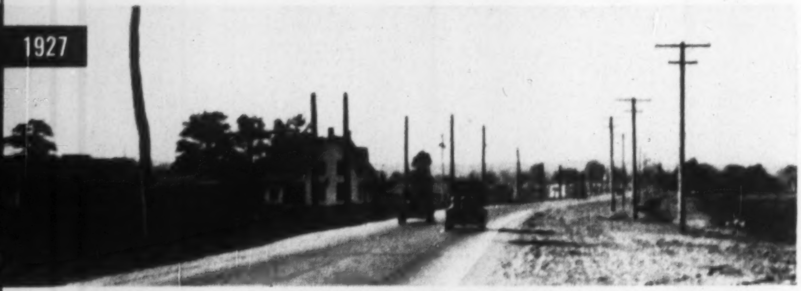
CHICAGO FLUORIDATES, NEW YORK HESITATES—The nation's second largest city will begin fluoridating its water next Thursday, but the program for the largest city has stalled, if the latest signs are any indication. Some 1,300,000 Chicagoans served by the South district filtration plant will be drinking the treated water next week; the remaining 3,450,000 residents will begin receiving fluoridated water in July. But, in New York City, the mayor has received an unexpectedly large mail in protest and is faced with vociferous criticism from his own Water Department officials (the city's Health Department having recommended fluoridation).

RIVER MODERNIZATION—This week saw start of construction on $73.6-million Markland Dam on the Ohio River, 65 mi downstream from Cincinnati. The Army Engineer project, key unit in the 12-ft channel scheme for the Ohio, will create an 87-mi pool, a stretch of navigable water five times longer than and without present hazards of the combined pools behind 10 existing dams. For commercial towboats it will mean an estimated annual savings of $1.4 million from increased operating efficiency.

THEY PLANNED FOR 1956

with an Armco Stream Enclosure in 1927

Only a wooden guardrail protected motorists from a plunge into the 10-foot-deep ditch.



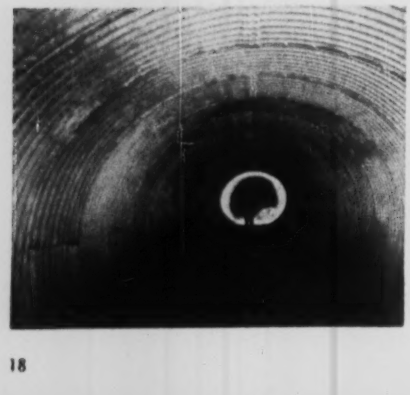
The Armco Pipe has been installed and the ditch hazard no longer exists. And the surrounding area has become more receptive to development.

Old steam shovel excavates ditch for 84-inch-diameter Armco Pipe.

This photo is of the same site as shown above—the house is the only unchanged landmark. The hidden Armco Pipe is still functioning efficiently.

Twenty-nine years ago, suburban Moraine City was a small Ohio community. Through it went the busy Dixie Highway, which paralleled a deep drainage ditch. The ditch caused many accidents. Motorists demanded that this traffic hazard be eliminated.

To do this, it was decided to replace the ditch with a stream enclosure of 84-inch-diameter Armco Corrugated Metal Pipe. With this solution, not only would the ditch be eliminated, but real estate development would be encouraged. The picture of this same site today proves the accuracy of this theory.



Interior of the Armco Pipe stream enclosure as it looks today. It looks good, is good—in spite of erosion problem.

Still Gives Excellent Service Today

As shown in the photo below, this 1750-foot-long Armco stream enclosure is still in excellent condition. The galvanized coating has given the Armco Pipe ample protection from erosion by sand and gravel.

Today, you can specify Armco Corrugated Metal Structures in a wide choice of protective coatings to guard against corrosion or erosion. Diameters range from 8 inches to 19 feet, and pipe-arch structures are available in comparable sizes. Write us for data. Armco Drainage & Metal Products, Inc., 4906 Curtis Street, Middletown, Ohio. Subsidiary of Armco Steel Corporation. In Canada: write Guelph, Ontario. Export: The Armco International Corporation.

ARMCO
DRAINAGE STRUCTURES

WASHINGTON OBSERVER

Government economists have taken a new look at the rate of housing starts. As a result, they have re-figured the meaning of the monthly starts which are converted to make the annual rate figure.

Result is a new figure lowering the annual rate of starts which has been used for the first three months of this year. When the new annual rate figure comes out, it will be less than the figure projected for the first three months of this year: 1.18-million for January, 1.2-million for February, 1.14-million for March.

Bureau of Labor Statistics officials say that these are exaggerated—that the winter months have been over-weighted.

The rate of starts now is figured at 1.1-million for the year so far instead of about 1.2-million. This statistical decline adds fuel to the fire the Democrats are trying to build under housing legislation that would stimulate building.

•

The temper of the Democrats is shown in the housing bill approved by the Senate Housing Subcommittee last week. Sen. Sparkman's group approved a measure that is very likely to be what the Senate finally votes. It provides:

Authority for the President to step up public housing to any rate between 50,000 and 200,000 per year until the present authorized 500,000 starts are contracted for.

It boosts housing for the aged by authorizing 75,000 public units in addition to the regular program.

The Senate version is the key to the final program Congress approves. The pattern is for the House to vote little or nothing, the Senate to go for a sizable program—then the two negotiate a compromise for Congress to adopt.

•

GI benefits that built 390,000 houses last year got a boost, from the Presidential Commission on Veterans Benefits headed by Gen. Omar Bradley—a former Veterans Administration administrator himself.

A two-year extension of housing rights was recommended for World War II veterans; but they offset this with a recommendation that the benefits be gradually tapered off until they are no different from those enjoyed by all citizens under federal housing laws.

This two-year extension, though, is more than Eisenhower asked—he is on record for letting the GI program end by July 1957, the date it would expire if no legislation is passed.

The commission also suggested that FHA take over the veterans program, including those for Korean War veterans.

•

American Road Builders Assn. urged its members to lobby for the highway bill. It is the first time in their 54 years that ARBA has asked their people to write, wire, or phone their congressmen in behalf of a piece of legislation.

The association felt that industry's position might not be clear—that criticism congressmen were given of detailed sections of the bill could obscure the fact that the industry solidly favored the Fallon Bill.

•

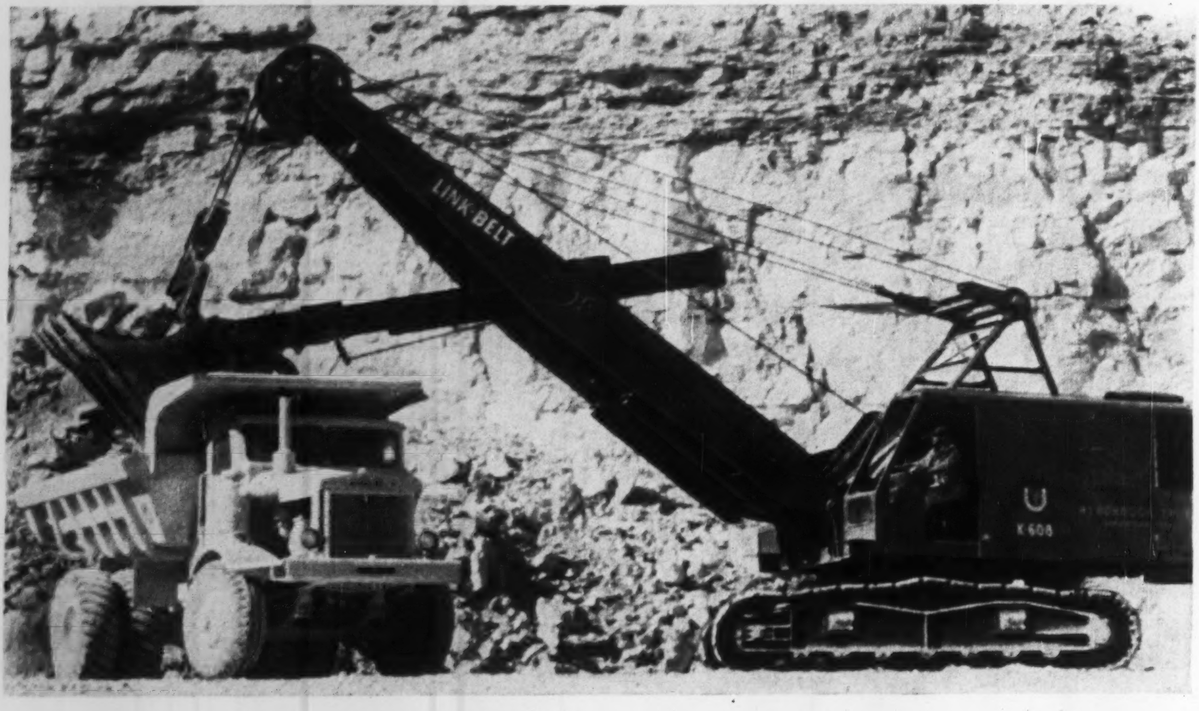
Bid forms for the first lease-purchase project are available now from General Services Administration headquarters in Washington, or the Chicago regional office. They're for a $1.6-million building in Rock Island, Ill.

•

Eisenhower has asked for the first money for Upper Colorado Construction. He's asked for $8-million. First contracts, for access roads to reach the Glen Canyon and Flaming Gorge Dam sites, will go out before year's end.

Bids for drilling diversion tunnels at Glen Canyon will be taken by June of next year. Rest of this initial money goes for plans.

It's time to compare . . . with LINK-BELT SPEEDER



Now Link-Belt Speeder gives you "small rig" speed in a

new 3-yd shovel-crane

Here's the K-608 with true power hydraulic controls. It's faster . . . more agile and mobile . . . easier to handle than many machines half its size!

THE only machine in its class offering true power hydraulic controls—the K-608 responds quickly, precisely, positively to a touch of its operator's fingertip. It all but eliminates operator fatigue, boosts output by up to 25% or more!

Furthermore, the way a K-608's power follows the load is all but unbelievable. That's because a torque converter and tailshaft output governor (standard) automatically and perfectly match engine output power to the load. You get heaping dippers in a hurry, save needless wear on the power train, cut fuel costs.

And, the K-608 is precision-made of quality components with plenty of stamina to stand up under continuous use of great usable horsepower. It's designed to cut downtime, too. Clutches are hydraulic actuated, automatically compensate for heat and normal lining wear.

Every day you don't have a K-608 on the job is costing you substantial extra output. One look will convince you. So why not call your distributor right now. Ask him where you can see a K-608 at work. Link-Belt Speeder Corporation, Cedar Rapids, Iowa. 14,081

LINK-BELT SPEEDER

Builders of a complete line of crawler and rubber-tired shovel-cranes

CHECK THIS BRIEF LIST OF THE OUTSTANDING K-608 ADVANTAGES

- 75 TONS RATED LIFTING CAPACITY
- GREATER OUTPUT. Torque converter and engine are matched for greater production during digging cycles.
- MORE LIVE WEIGHT because extra strength and heft built into every component eliminates need for excessive "dead" counterweight.
- ALL-WELDED, STRESS-RELIEVED UPPER AND LOWER FRAMES increase machine life.
- POSITIVE INDEPENDENT CHAIN CROWD
- HYDRAULIC-ACTUATED, SELF-COMPENSATING CLUTCHES minimize downtime for frequent hairline clutch adjustment.
- EXCEPTIONAL GROUND CLEARANCE.
- FREE-SPOOLING DRUMS mounted in anti-friction bearings allow greater free rolling action with minimized power loss . . . positive alignment makes smoother braking, clutching.

NEW CATALOG

on the K-608 is yours for the asking. Get it from your distributor or write direct. Ask for catalog 2552.

APRIL 26, 1956

ENGINEERING
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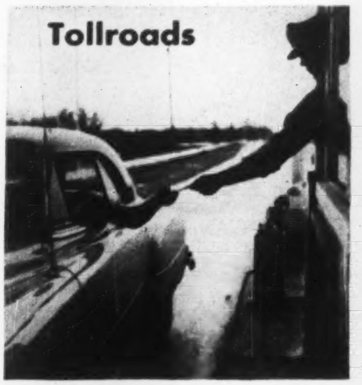


► **With the best toll routes already occupied . . .**

► **A federal highway system before Congress . . .**

► **And an unwillingness of truckmen to trade money for time . . .**

A Five-Year Boom Draws to a Close

An ENR Staff Report

The bloom is very definitely off the tollroad rose. In part because of pending federal legislation, but largely because of economics, state after state is shelving plans for pay-as-you-ride highways, and it's apparent that once the highways now under construction or well into the contract letting stages are completed, there will be little further tollroad construction.

That's not to say that there's anything wrong, economically, with most of the toll facilities already built and operating. On the contrary, most of them are meeting their financial obligations—some have, in fact, run fantastically ahead of predictions—and all are showing healthy increases in business.

But the end is in sight. A broad survey by ENR's editors and correspondents has turned up a number of reasons for this—reasons that add up this way:

- The factor of economics is paramount in constructing tollroads—the economics that dictated the construction of the first and most successful of them in areas where they were most obviously needed, thus preempting the best locations and forcing further plans into the marginal areas.
- Pending federal highway legislation—providing 90% federal matching funds for interstate system roadbuilding—has caused many states to hold back on tollroad ventures until Congress acts.
- Deep and very real differences in philosophy in the free road vs. toll road schools of thought.
- The fact that the trucking industry—on which much of the planning for toll turnpikes is necessarily based—is a hard-headed business group that has to be sold.
- The obvious willingness of private car owners to use the superior toll facilities—but the also obvious fact that their tolls can't meet the costs of a highway built with an eye toward the requirements of heavy trucks.

• **Economics first**—The great surge in tollroad construction in the United States, particularly in the past five years, has introduced the new factor of economic value—rather than purely social value—into roadbuilding. Not so much the economics of whether the federal government will or will not increase its financial aid, but rather the simpler, down to earth economics on which a successful business venture is based.

For most of the turnpike officials told ENR the same thing: A tollroad is a business proposition. It is in competition for business. Therefore it is not enough to add another facility or product—that new facility must be sufficiently better in every way, must offer enough advantages, to attract the business away from competition or generate new business.

Thus construction of a tollroad cannot be justified alone on the ground that it is a simple, quick, and nearly painless way to get a desirable road built quickly. It cannot be justified alone because of bad terrain or congested areas. It cannot be justified alone because it connects major centers.

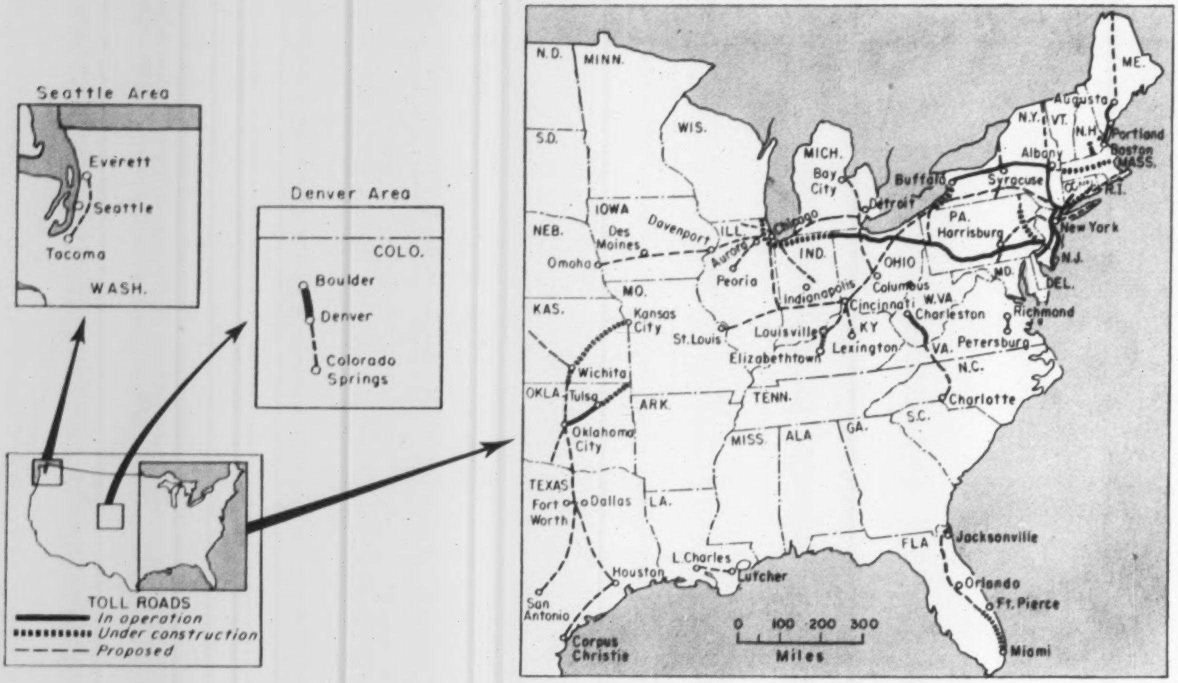
An example is readily at hand in West Virginia's Turnpike—one of the main causes for jitters over turnpike financing that has afflicted the financial community. Without question, this fine road smooths out some of the roughest terrain anywhere in the United States. But, in the local phrase, it "connects East Overshoe with West Overshoe"—and it hasn't paid out, although its financial picture has been improving very slowly.

To the contrary, the oldest and strongest of the modern turnpikes—Pennsylvania's—combines three advantages: It eases some very rough terrain; it connects a number of major industrial centers directly; it could be built at costs that were reasonable but that couldn't have been met without resort to bond financing.

New Jersey's fabulously successful turnpike is another example: It connects and is a corridor through some of the world's biggest traffic-generating areas; it cuts through a hard-to-travel area (not poor terrain, but an almost solidly built-up metropolitan area); the state couldn't have paid for it by normal means in and reasonable time.

Ohio's recently publicized troubles with its new facility (ENR March 22, p. 23) could be another example—although the figures now available on early operations cannot fairly be considered as a basis for judgment. But Ohio's terrain isn't too difficult for trucks, the existing free roads are passable, and the truckmen as yet haven't been convinced that the new road offers sufficient advantages to attract them from the free roads they're using.

(*Continued on page 22*)


Seattle Area
Everett
Seattle
Tacoma
WASH.
Denver Area
COLO.
Boulder
Denver
Colorado Springs
TOLL ROADS
In operation
Under construction
Proposed
N.D.
MINN.
S.D.
WIS.
MICH.
Bay City
IOWA
Des Moines
Davenport
ILL.
Aurora
Chicago
Detroit
Buffalo
Syracuse
Albany
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New York
N.J.
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Omaha
Peoria
IND.
OHIO
Columbus
MD.
DEL.
MO.
Indianapolis
Cincinnati
W.VA.
Charleston
Richmond
KAS.
Kansas City
St.Louis
Louisville
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Jacksonville
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Miles

. . . Tollroad construction boom fails

• **Long haul vs. short haul**—In the general consideration of economics, all concerned should look at another point that hasn't been too obvious: The advantages of thousand-mile distances without traffic lights or intersections (other than toll booths) have apparently been much overrated.

The most profitable section of the New Jersey Turnpike, for example, is a section about 17 mi long (compared to the 118-mi length of the road) between tunnel and ferry discharge points on the Hudson River and the Secaucus Interchange, near Newark. This segment alone, say Jersey officials, produces about 50% of the revenue of the entire road.

Pennsylvania doesn't break down its revenues into easily comparable sections, but spot checks by the Turnpike Commission indicate that the average length of haul on its 260 mi of 'pike is less than 100 mi.

• **Politics—local ~~and~~ national**—No realistic study can leave any doubt that local political considerations can and do affect the construction of toll facilities. One motivation has been to get financing outside budgetary debt limitations; satisfaction of demands of voters in given areas is another.

But overshadowing these considerations now is uncertainty over federal government action on current highway legislation. Obviously, if the federal government will contribute 90% of the cost of new work on the interstate system, which includes all projected tollroads, there's no point in annoying voters with toll collections.

For these reasons, many states—Indiana, Michigan, Wisconsin, Washington, Iowa, among them—have announced that they are shelving all plans, until Congress acts.

• **Toll vs. free**—Aside from economic considerations, the question of moral rightness of toll highways as opposed to free roads is deeply felt in many places, and is a real deterrent to tollroad construction.

Although he qualified his remarks by mentioning that there is some doubt that traffic would sustain such roads, Wyoming's Governor M. L. Simpson told ENR: "I am now, and have been much opposed to any tollroads in Wyoming. I'd rather have a freeway any day." Michigan's Highway Commissioner, Charles M. Zeigler, an opponent of tollroads in his state, has been pushing plans for free road construction that would certainly cast any tollroad's financial stability in doubt.

And in other states—notably sparsely populated ones, but including big California—there is little thought to tollroad construction. Vermont contemplates a 346-mi north-south limited access—but free—road; Oregon can't see any reason for such roads; neither can Nevada, Utah nor Idaho.

• **And the trucks**—There is no question that all of the modern toll turnpikes have been built basically to accommodate truck traffic. That's the reason for expensive and tremendously strong structures and pavements that are designed in at least one instance to take trucks weighing up to 101,000 lb. (One of the major business-getting attractions of the Pennsylvania Turnpike, for instance, has been that trucks can travel it, although their operators would be violating state weight laws on other highways.)

The trucks, with their great weights, their heavier consumption of fuel, are always counted upon to provide the bulk of the revenues that make the 'pikes possible.

And the truckmen have proved to be tough customers who must be sold on the savings possible on the tollroads, and who are perfectly capable of staying off the new roads, if they think the rates too high.

And a basic understanding of how the truckmen do business seems to be lacking—particularly among advocates of toll highways.

In the first place, comparatively few of the trucks on the nation's highways are transcontinental haulers, or even haul for distances up to several hundred miles. By far the majority are short-haulers.

Secondly, under union rules of the last few years, most drivers (if they aren't working for themselves) are paid by the trip—not by the hour. And the owner himself is also paid by the trip

Tollroad Construction Programs, 1955-1956

Reported by Turnpike Authorities, Commissions and State Highway Departments to Engineering News-Record, in thousands of dollars

	Contracts			Maintenance						Equipment Purchases		
				By Own Forces			By Contract					
TOLL AUTHORITIES	Let 1955	Scheduled 1956	Percent Change	1955	1956	Percent Change	1955	1956	Percent Change	1955	1956	Percent Change
California Toll Bridge Authority	....	$68,000a	....	....	....	....	....	....	....	....	....	....
Florida State Turnpike Authority	$22,941	35,000b	+53	$37	$163	+341	....	....	....	$86	$160	+86
Illinois Toll Highway Commission	....	60,597c	....	....	....	....	....	....	....	....	....	....
Indiana Toll Road Commission	71,120	None	....	None	....d	....	None	None	....	None	....d	....
Kansas Turnpike Authority	104,000	2,500	−98	None	25	....	....	....	....	30e	1,000e	+3,233
Maine Turnpike Authority	1,970	1,000	−49	170	311	+82	....	....	....	91	150	+65
Massachusetts Turnpike Authority	None	None	....	....f	....f	....	....f	....f	....	....	....	....
Michigan Turnpike Authority	....	....g	....	....	....	....	....	....	....	....	....	....
New Jersey Turnpike Authority	64,700	50,000	−23	1,460	1,740h	+19	....	....	....	....	....	....
New Jersey Highway Authority	3,275	10,000	+205	907i	1,131i	+25	....	78	....	135	100	−26
New York State Thruway Authority	43,000	....j	....	....	....	....	....	....	....	....	....	....
Carolina-Virginia Turnpike Authority	....	....k	....	....	....	....	....	....	....	....	....	....
Ohio Turnpike Commission	None l	None	....	313m	1,151m	+268	....	35	....	653	40n	−94
Oklahoma Turnpike Authority	30,356	12,000o	−60	....	....	....	....	....	....	....	....	....
Pennsylvania Turnpike Commission	72,000	52,000	−28	....	....	....	....	$1,423p	....	....	....	....
Rhode Island Turnpike and Bridge Authority	....	....q	....	....	....	....	....	....	....	....	....	....
Texas Turnpike Authority	13,524	38,476r	+185	None	None	....	None	None	....	None	None	....
Texas Turnpike Company	....	....s	....	....	....	....	....	....	....	....	....	....
The Richmond-Petersburg Turnpike Authority	100	20,000t	+19,900	None	None	....	None	None	....	None	None	....
Old Dominion Turnpike Authority	....	....u	....	....	....	....	....	....	....	....	....	....
Washington Toll Bridge Authority	None	15,000v	....	v	v	....	v	v	....	....	....	....
West Virginia Turnpike Commission	500	200	−60	200	200	0	$175	100	−43	50	20	−60
TOTAL—ALL TOLL ROAD AUTHORITIES	$427,486	$367,773	−15	$3,087	$4,721	+53	$175	$1,636	+835	$1,045	$1,470	+41

STATE HIGHWAY DEPARTMENTS WITH TOLL PROJECTS

California (Carquinez Bridge Projects)	....	$26,704	....
Connecticut	$68,900	180,000	+161
New Hampshire	9,000	9,000	0
Maryland	80,000	14,000	−82
TOTAL—STATES	$157,900	$229,704	+45
GRAND TOTAL	$585,386	$594,477	+2

Maintenance expenditures and equipment purchases by state highway departments reported in Engineering News-Record, April 19, 1956, p.24.

a—Richmond-San Rafael Bridge being constructed by California Toll Bridge Authority and to become a state highway upon completion.
b—$15 million bobtail bonds sold; $20 million full-length-bond sale scheduled for July 1.
c—Excludes $30 million for right of way and includes $10.6 million for engineering. Land acquisition program underway April 1 for 193.3 miles of toll roads.
d—Budget for 1956 in process. Some new maintenance equipment will be needed.
e—Entire maintenance equipment outlay expected to be purchased in '56. Only minor items used in seeding operations by own forces purchased in '55.
f—No decision on whether own forces or contract system will be used for maintenance.
g—State does not anticipate placing any work under contract in '56. Any extensive engineering work done this year will depend upon action of the legislature.
h—Includes maintenance for new extensions in '56.
i—Lower maintenance cost in '55 occasioned by fact that only a portion of Garden State Parkway was under maintenance in '55.
j—Data not available because of shortage of engineering staff.
k—Project at standstill due to inability of owners to sell bonds.
l—Turnpike opened Oct. 1, '55. Commission considering possibility of amplifying some present facilities, but no money appropriated.
m—Difference between '55 actual and '56 budget results from opening of entire turnpike on Oct. 1, '55.
n—Erosion control expected to be a factor in '56. Commission may purchase crane.
o—Northeastern Turnpike, 88.5 miles long, to be opened to traffic in 1957 and designated the Will Rogers Turnpike. Authority now preparing traffic, revenue, and cost studies on three additional turnpikes: the Northern Turnpike from Oklahoma City to Wichita, Kan.; the Southwestern Turnpike from Oklahoma City to Wichita Falls, Texas; and the Southern Turnpike connecting Tulsa and Oklahoma City with the Dallas-Fort Worth area of Texas. Studies scheduled for completion on Aug. 1, '56 and Authority plans to finance one or more additional turnpikes as soon thereafter as results of studies can be evaluated.
p—Fiscal year '55-'56; includes $1 million for relighting and resurfacing tunnel walls. Some 40 miles of medial surface stabilization and 40 miles of medial barriers to be constructed this year.
q—Authority continuing investigation of feasibility of toll road facility in state.
r—Project to be completed mid-1957.
s—Company unable to complete financing.
t—Major contract work to get under way by June 1, '56.
u—Studying feasibility of road project; no definite answer before July, '57.
v—Covers Vancouver-Portland Interstate Toll Bridge, the Maple Street Toll Bridge in Spokane and the Port Washington Narrows Bridge in Bremerton.

—very seldom on a basis of time. So that the whole question of the time savings possible on the turnpikes becomes less important than many have believed it would be when the roads were first planned.

Another point: A spot check among truckmen makes it obvious that they don't work to split-second timings that would make quick turn-around, for example, too important a factor. Actually, it makes little difference financially to many operators whether a truck arrives in, say, Cleveland, at 3:00 in the afternoon or at 5:00—it will lay over in Cleveland overnight anyway.

Even the long-distance haulers are using off-loading terminals and other facilities along the way to break up the length of haul for driver and machine—which makes for better handling of their less-than-full-load shipments.

With these few considerations in mind, it becomes obvious that a fee of about $30 for a heavy truck to cover the 241-mi length of the Ohio Turnpike seems unreasonable to a truck operator who can cover the same distance over free roads and can see no particular dollar saving because of time and fuel consumption.

• **Remedies**—Answers to some of these problems are in the making—notably in the meeting scheduled for April 23 at Philadelphia, at which officials of four connecting turnpikes discussed cooperation to increase traffic.

One answer—not an easy one—would be uniform rates on all 'pikes. At present—because of classification differentials, the same truck may pay more in one state than another for the same mileage. For instance—because of classifications—a 50,000-lb truck would pay $23 to cover the Pennsylvania Turnpike, but only $14.50 on the Ohio road.

Uniform rates also might make possible selling "through tickets", as railroads and airlines do, that would cover routings on several turnpikes without the necessity of continual stopping for payment of tolls. The knotty problem on rates, of course, is the widely differing financial and cost bases of the turnpikes.

As business organizations, the turnpike authorities have also pushed—and will do so more vigorously—real advertising and promotional campaigns, designed to attract both truckers and private motorists to their roads by playing up the advantages to be gained. One—Ohio—has gone so far as to set up special rest rooms and lunch counters for truckers.

• **Reports**—ENR's reportorial staff, digging for the basic facts that were needed for the foregoing general story on the U. S. turnpike situation, turned up much additional information that serves, in a sense to update information on turnpike construction and financial situations.

Turnpike-by-turnpike, here's what they found:

New England

As a whole, New England has under construction some 720 mi of tollroads, which will cost $1 billion. Biggest projects under way are Massachusetts' $239-million east-west turnpike (ENR Oct. 20, 1955, p. 38) and Connecticut's $400-million 'pike; but both Maine and New Hampshire have construction going.

Under control of the Massachusetts Turnpike Authority, the 123-mi road is being built without state support. Principal question at the moment is how to bring the road into the city of Boston itself, from its terminus on the circumferential Route 128 near the suburb of Weston. Several routes, including an elevated structure over the Boston and Albany Railroad's track's, are under consideration at the present time.

Maine's recently extended turnpike (ENR Dec. 22, 1955, p. 22) has proven its ability (after a slow start) to make financial ends meet.

New Hampshire has found its tiny (12-mi) East Coast Turnpike, from the Massachusetts line near Newburyport to Portsmouth, so successful that it can easily finance an extension inland to Dover and Rochester. The state is building another tollroad northward from the state line at Lowell, Mass., to Nashua and Concord. The State Highway Department—not separate authorities—builds and operates the toll facilities.

With the opening of the 1956 construction season, Connecticut is pushing work on its 'pike, to connect with the New York Thruway spur and run along the state's coastline to Killingley, on the Rhode Island border.

New Jersey

On the basis of initial performance, New Jersey's Turnpike may be the most successful long-haul tollroad in the world. Traffic and revenue estimates made prior to completion have been outdistanced so far and so quickly that they are almost out of sight.

Pre-completion estimates of traffic were 7,600,000 vehicles, producing a revenue of $7.2 million, with another $536,000 to come from concessions. But vehicle traffic in the first year was in fact 18,239,527, and by the end of 1955 had reached 25,888,319 (which was greater than had been estimated for 1980), with an average daily revenue of almost $58,000.

That huge flood of traffic has changed the Turnpike Authority's planning in several directions: $21.5 million worth of added traffic lanes have been put in place to provide six-lane operation from the George Washington Bridge for a distance of 83 mi to near Camden; an extension—at the cost of $118 million—across Hudson County and Newark Bay to connect directly with the Holland Tunnel; and the $27-million share of a connection at Edgely, Pa., over the Delaware River, with the Pennsylvania Turnpike.

The Garden State Parkway—unique among modern turnpikes in that it was built for passenger vehicles only—is doing surprisingly well. Original estimates for the first full year of operation were $12 million in revenue. Actually with its full length in operation only since July 1, the 1955 revenue exceeded $9.3 million.

Pennsylvania

Oldest of the modern turnpikes (first 160-mi section opened in 1940) Pennsylvania's Turnpike is financially solid, and still growing. Now with a total of 360 mi of road under toll, it is adding the 110-mi northeast extension to Scranton and beyond (ENR March 15, p. 40), and legislators have authorized four other extensions, if turnpike engineers find them feasible.

In its November-May fiscal year, it had a net profit of $9 million, up nearly $1 million over the previous fiscal year. In that fiscal year period, it carried 11,868,465 passenger cars, 2,484,000 trucks, 56,586 busses.

New York

New York State's spectacular Thruway is now open over 424 mi of its planned 562-mi length (including spurs), although some of this total mileage was opened as late as December 15, 1955—including the most important Tappan Zee Bridge (ENR Dec. 15, 1955, p. 25). To cost a total of about $1 billion, the Thruway Authority estimates it still has to spend $297 million of that amount to complete all phases of the project.

Often called "the perfect tollroad" by engineers and economists (since it has major traffic-generating cities at frequent intervals along its course) the Thruway has performed, financially, to the satisfaction of its sponsors.

Original estimates predicted a gross revenue of $35 million by the end of 1965. In 1955 revenues were $16.6 million—with 138 mi of the best revenue-producing sections yet to be opened to traffic.

Florida

Authorized by the state legislature in 1953, but not started until spring of 1955, construction operations on the Florida Sunshine State Parkway (the "bobtail pike") have been going at full speed ever since. With the advantages of climate and terrain, surprisingly low bidding is expected to result in a saving of about $22 million under the estimated $65-million construction cost on the 108-mi road.

Ohio

Plagued by some hasty judgments, some unfortunate publicity and a very real resistance on the part of truck operators, Ohio's brand-new 241-mi turnpike has been one major cause of the financial clouds over the whole turnpike scene.

It is undeniable that the turnpike's revenues in its first few months of operation have been disappointingly low. But it is much too soon to say that the 'pike is a financial failure—the opening months were in winter, many facilities and connections have yet to be completed. And figures for March and April show heartening signs of improvement—in March the daily average of tolls was $25,000, in April they were running at about $80,000.

Traffic revenues for the first year had been estimated at $19.2 million, with nearly $9 million to come from trucks. In the first six months, however, revenues were actually $2.9 million, of which only $1.7 million came from trucks.

Meanwhile, the 'pike's difficulties have thrown a major block into plans for a north-south turnpike, now under detailed study.

Illinois

After more than a year's delay, caused by legal obstructions, the Illinois State Toll Highway Commission's 193-mi, $415-million toll project is beginning to move. This week (April 26) bids will be taken on a test bridge of prestressed precast reinforced concrete—and if accepted, this design will be applied to some 200 bridges, to cope with steel shortages.

Field surveys are being expedited, and first right-of-way purchases are expected by May 10; consulting firms have been selected on all 24 design sections of the three routes planned: The 88-mi Tri-State route circling Chicago south and west; the 88-mi Northwest route to Rockford and the Wisconsin state line; and the 25-mi East-West route to Aurora. Construction should get under way by July of this year.

Meanwhile, bids were taken early this month (ENR April 12, p. 29) on two contracts for the $88-million Calumet Skyway, planned to connect Indiana's east-west tollroad with State Street.

Indiana

Construction of Indiana's east-west toll route is running about 5% ahead of schedule, with timetable opening of sections set this way: The first 50-mi section from the Ohio border westward, July 1; the next 75-mi section, Sept. 15; the entire road, Nov. 15. To date, contract prices have run about $17 million under estimates, but right-of-way costs have partly offset the savings.

Surveys for a proposed north-south route are still going on, but Gov. George W. Craig said plans for construction would be held up until Congress takes action on federal aid to highways.

Kansas

As of March 31, the Kansas Turnpike (ENR Feb. 23, p. 36) was 42% completed, slightly behind advance scheduling, due, officials said, to bad weather. But grading was 71% complete, bridges 55% complete.

But, engineers reported adversely on feasibility of a proposed road to connect Wichita and Hays, and the likelihood of its construction is now nil.

Oklahoma

Despite somewhat discouraging reports on the feasibility of parts of the system, there's an all-out campaign afoot of finance three tollroads that would total more than 400 mi in length and cost possibly $400 million. Traffic engineers, in a preliminary report, said that traffic would be insufficient to support one of the three roads—northward from Oklahoma City to Wichita, Kan.

Gov. Raymond Gary has advanced a "package" plan, now under study, in the hope that by putting all three roads (one from Oklahoma City southwestward, another southward toward Tulsa, and some highway to the north) into one package, investors would agree that the roads could carry each other.

Key to the drive for the new roads —which also depend on hoped-for connections in Texas—is the success of the state's 88-mi Turner Turnpike, connecting Tulsa and Oklahoma City. Built at a cost of $38 million, the road has been outrunning estimates, with revenues of more than $6.5 million within its first three years.

Kentucky

About two more months of good weather are needed to complete Kentucky's 40-mi tollroad (ENR Dec. 15, 1955, p. 34) between Louisville and Elizabethtown. About three miles of paving and some cleanup work remains to be done. The state has no plans for any other toll facilities.

Texas

Pending federal highway legislation will not affect construction of the Texas Turnpike Authority's Dallas-Fort Worth Turnpike, scheduled for completion in July 1957.

Meanwhile, the authority has commissioned consulting engineers to study feasibility of a turnpike linking Houston with the Dallas-Fort Worth area—a project originally planned by two private companies which have abandoned their plans because of lack of financing. Backers of the two companies (The Texas Turnpike Co. and Sam Houston Toll Road Co.) cooled on the projects, when neither company was able to get written commitments from the state guaranteeing that no public or private roads would be built parallel to the toll roads.

The Highway Bill—Up at Bat This Week

The multi-billion-dollar federal highway program comes up for a vote in the House this week. A package affair, it calls for a $51.5-billion, 13-yr construction program and a 16-yr-pay-as-you-go taxing program designed to bring in around $14.8 billion in increased taxes.

Here's how the bill was finally reported to the House:

- **Money will be spent on the 40,000-mile interstate system on a matching basis of about 90% federal, 10% state; 50-50 matching for primary, secondary and urban roads will be continued.**
- **Taxing calls for a 16-yr $38.8-billion construction trust fund to be set up beginning July 1, 1956. Money from existing user taxes plus increases (ENR Feb. 9, p. 21) will go into the fund.**
- **The Davis-Bacon Act goes with the interstate portion of the program. It calls for the Secretary of Labor to set prevailing wages as is now done on construction programs solely financed by federal funds.**
- **Reimbursement for existing highways which would become part of the interstate system was written to say that it is the "intent" of Congress to pay for roads built—after August 2, 1947, free roads built under the 60-40 federal-state financing plan and tollroads which meet interstate standards would be eligible for credit. The language of the present bill compromises the position of the highly populated Eastern states that have tollroad programs and demand credit for what they have built. Final decision on credit is left for later Congressional action after a two-year study is made by the Commerce Department, Bureau of Public Roads and other state and federal agencies.**
- **Where states pay for relocating utilities, the federal government will reimburse them on the same basis as is being done for the project under construction—90-10 if it is on interstate roads, 50-50 for others.**
- **Axle weight—but not gross weight or dimension—restrictions are placed on big trucks using the highways. States won't get federal money if they increase axle weight limits over those in effect July 1, 1956, or allow trucks to operate with weights in excess of 18,000 lb carried on any one axle, or 32,000 lb on tandem axles; states can use whichever is greater.**

Road Call

Western highway officials cited nine needed actions

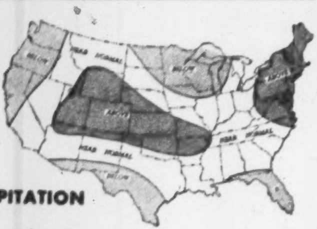
The annual meeting of the Western Association of State Highway Officials in Phoenix, Ariz., produced the normal complement of useful papers on road design and construction practices, but it was most notable for the clear-cut nature of a series of resolutions that it issued. Nine actions were cited, which are deemed necessary to advance roadbuilding and to improve its efficiency. Each has widespread applicability.

These WASHO resolutions called for:

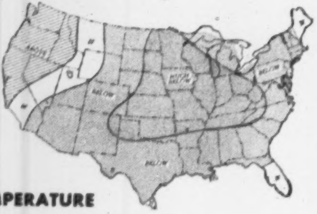
- Passage of an adequate highway bill at this session of Congress.
- Action by Congress to permit stockpiling of emergency bridges in probable disaster areas.
- Action by the national highway officials group to standardize road map symbols and cartography in producing state highway travel maps.
- Action at a national level to require steel and cement suppliers to guarantee time of delivery and to quote firm prices.
- Approval of additional authority to division and district engineers of the Bureau of Public Roads so that policy problems may be settled without Washington decision and accompanying delay.
- Review of highway engineering salaries with a view to adjustment.
- Cooperative state-federal programs to salvage geological, archaeological and historical remains that are in danger of being destroyed as a consequence of highway construction.
- Speed-up of construction of the forest highway system through Congressional action.
- Action by state officials to refuse road permits to house trailers built wider than 8 ft.

Many of the activities and papers at the convention also revealed a concern for the new problems that will arise when construction of the enlarged interstate highway system is undertaken. States that do not have a limited access law were urged to enact one.

Arizona's experience with an electronic computer in developing and checking fill areas was cited as a means of conserving manpower. Attempts to aid contractors to increase their efficiency as by giving them more time to inspect jobs before they bid and by letting contracts with sufficient time for ordering materials were also recommended. States also were urged to seek authority to acquire right-of-way facts in advance of need.



PRECIPITATION



TEMPERATURE

30-Day Weather Outlook

The Weather Bureau's 30-day outlook for the period from mid-April to mid-May calls for temperatures to average below seasonal normals in the eastern three-quarters of the United States, with greatest departures in the Midwest. Above normal temperatures are indicated in the Pacific Northwest and near normal elsewhere.

Precipitation is expected to exceed normal in the North and Middle Atlantic States, the Central Plains, and the Central Mountain States. Subnormal amounts are predicted along the West Coast, in the Rio Grande and Upper Mississippi Valleys, and over Florida. In other areas near normal rainfall is anticipated.

Milwaukee Sewage

$44-million plan includes plant, 35 mi of sewer line

A $44-million scheme for sewage disposal has been recommended to Milwaukee's City and Metropolitan Sewerage Commission by the consulting firm of Alvord, Burdick and Howson of Chicago.

The recommendation of a new disposal plant along the lakefront and about 35 mi of interceptor sewers comes as a result of nearly five years of study. The engineers claim that their scheme would practically eliminate present bypassing of raw sewage into Lake Michigan.

They point out that an additional 15 mi of interceptor sewers could be built for $7.5 million to serve the expanding population of the southern end of Milwaukee County. Still another area, the eastern part of Waukesha County, could be made to be served by the plant with another $1.4 million worth of construction.

The consultants warn it would be unwise for the district or the city to separate the combined sewers in older parts of Milwaukee. Figuring the cost of new sanitary sewers, cost of connection to them and interference with industry and business, they put a rather formidable price tag of $225 million to $250 million on this contemplated change-over.

AIA Fights Delaware Fee Limit

All planning on $40 million worth of schools has ground to a halt in Delaware while the state and the American Institute of Architects remain deadlocked over the size of fees. The 48 projects affected amount to all but $4 million of the state's entire school building program.

The disagreement stems from a newly enacted statute limiting professional fees for school buildings to 5% of construction costs. Heretofore architects have received 7% for school jobs, according to Leon N. Fagnani, president of the Delaware Chapter, AIA. Out of this, they have paid 2¼% for engineering services.

Engineers' fees were specifically brought within the 5% total in an opinion handed down by the state attorney general's office after the architects balked. Replying to a query from the State Board of Education, chief Deputy Attorney General Herbert L. Cobin made it clear that the 5% limit could not be applied separately to each of the two professional groups.

As the impasse stands now: Dr. George Miller, State School Superintendent, has notified all school building commissions that before the State Board of Education will approve school plans, the architect must sign a contract embodying the 5% fee limit; and the members of the advisory committee of the AIA chapter (representing 99% of the architects in the state) have declared that they will not sign any school contracts until the legislature reconsiders the law. The legislature is not scheduled to meet again until May 27.

Mr. Cobin speculated that 5% might be enough on projects costing $1 million or more but too little on smaller jobs, with the possible result that some communities would be deprived of competent architectural and engineering services. However, 11 of the 48 jobs affected top $1 million. The biggest is estimated at more than $7 million.

In explaining the architects stand, Fagnani said: "Under the circumstances we feel the 5% fee is so low that we cannot do anything but refuse to sign the contracts."

Alaska Gets Going

Set for big construction year despite a late start

Inclement weather and unusually heavy snowfall slowed the start of what promises to be one of the best years in Alaskan construction, despite what is described as a "tapering off" of military spending.

The $1-billion DEW-line that stretches across the continent has put a heavy drain on the area's labor market, although hiring, which was expected to begin as early as January, did not start until March.

Work is beginning on radar sites on the Alaskan northwest coast as construction goes into its second year. There is work also under way on the government's "White Alice" project this season. This integrated Alaskan communications study at Middleton Island, in the Gulf of Alaska, provides circuits in support of the Alaska Air Defense System.

The U. S. District Engineer has announced that this season should see a leveling off in defense spending in northern Alaska and increased activity on civic works projects, such as power dams, flood-control systems and civil building construction. Extensive road-building proposed for this summer will nearly complete the Alaska Road Commission program initiated in 1948.

Though construction work in other parts of the territory will be slowed by the snow, many bids are being advertised and contracts awarded, thus indicating a good season in the area of the territory's largest cities, Fairbanks and Anchorage.

Near Fairbanks, two major expansions are under way—a multi-million-dollar improvement Eielson Air Force Base, 26 mi from the city, and expansion of the near-inactive Army camp near Big Delta into the largest post in Alaska, with the new name of Fort Greely.

Urban Area in Connecticut Gets Coordination Committee

Connecticut's Governor Ribicoff has named a seven-man committee to explore the feasibility of coordinated planning for Hartford and eight surrounding towns on a regional basis.

Right now, there exist three different regional bodies at work on individual problems facing all or most of the nine communities. The new committee would seek means of coordinating these groups as well as other planning for regional growth.

Chief among the established regional agencies is the Metropolitan District Commission which for 26 years has been administering the area's sewage and water systems.

Last year the Greater Hartford Bridge Authority was formed to plan and construct five bridges across the Connecticut River above and below Hartford. One of these is already underway.

The Park River Flood Control Commission also was set up in 1955 to plan measures to prevent the Park River from flooding Hartford and the communities through which it flows.

Summer Start on N. Feather River Program Is Predicted

Pacific Gas & Electric Co. will start work this summer on the first phase of its $68-million North Feather River expansion program—much ahead of the November 1957 starting deadline set by FPC (ENR Dec. 8, 1955, p. 26).

Two powerhouses, Butt Valley and Caribou 2, will be constructed at a cost of $32.6 million. Utilizing waters from existing Lake Almanor, they will have a combined generating capacity of 145,000 kw. Still to be scheduled is Belden powerhouse, to cost $25.8 million and to produce 113,000 kw. PG&E has until November 1959 to begin this one.

The three new power plants, totaling 364,000 kw, will bring PG&E generating capacity on the N. Feather River to 750,000 kw from ten plants.

Shortage of Steel Is Blamed For Connecticut Bridge Delay

Connecticut State Highway Commissioner Newman E. Argraves has announced that the critical steel shortage will double the time required to complete the $6-million bridge across the Connecticut River between Hartford and East Hartford. The span's substructures are expected to be completed this summer.

The proposed highway approaches on both sides of the river are now in early design stages while the superstructure design is just short of completion.

Argraves said advertising of bids for the superstructure will not be made before late April with the contract award scheduled for approximately two months later.

He estimated that completion of the span will require two years because the contractor who obtains the superstructure contract will have to wait from 12 to 14 months in order to get delivery on steel.

If steel were readily-available at the present time, the superstructure could be completed in approximately nine months.

Not Enough Water

Paper firms drop plans for expansion in N. C. area

Insufficient release of water from two dams on the Roanoke River has caused at least two paper companies to halt, temporarily, plans for $80 million worth of developments in North Carolina. This is according to E. C. Hubbard, executive secretary of the North Carolina Stream Sanitation Commission.

Hubbard said the situation stems from out-of-date minimum water flow data now utilized at Army Engineer-operated John Kerr Dam at Buggs Island, Va., and a recently dedicated dam at Roanoke Rapids, N. C., which was built by the Virginia Electric & Power Co.

A steering committee of state and federal conservation officials has drawn up temporary stream flow recommendations that it hopes the two dam operators will adopt so that a comprehensive three-year stream study can be completed satisfactorily. Then permanent standards would be established.

Hubbard has conferred in Washington with Interior Department and Corps of Engineer officials about the problem. The Corps has indicated that it was studying the stream flow problem.

In the meantime, Halifax Paper Co. has delayed expenditures of $30 million for expansion of two facilities along the Roanoke while another large paper and pulp company has abandoned, for the present, plans for a $50-million plant on the Roanoke below Weldon, N. C.

$100-Million Bond Issue for Kentucky Highways Is Passed

A bill for a $100-million bond issue, passed by Kentucky voters at the general election, has received final passage by the state legislature. The issue would provide matching funds for federal-aid highway grants to the state.

The measure, advocated by Governor Chandler, would pledge the full faith and credit of the state for 30-yr retirement of the bonds.

Also given final legislative approval was a bill imposing a 2-cent-per-gallon surtax on motor fuels used by four-axle heavy trucks using the state's highways. Also enacted was a measure giving new and more direct control over rural roads. Under the latter measure, the State Division of Highways may build rural roads that will be maintained by the counties. Up to now, the state was required to maintain every rural road it built.

Unionization of CE's to be emphasized but . . .

ESA Rejects Tie With AFL-CIO

Unionization of civil engineers will be given special emphasis in an intensive organizing campaign mapped by Engineers and Scientists of America at its national convention in Dallas last weekend.

But, ESA summarily rejected affiliation with the labor movement—either by direct charter from AFL-CIO or by merger with the American Federation of Technical Engineers.

Instead it took these steps to extend its influence in engineering:

- Voted to sponsor and fight for legislation that would create a separate classification system for some 50,000 engineers and scientists on the federal payroll—with the aim of upgrading their salaries.
- Decided to counteract what its leaders charged as efforts to "condition" engineering students against collective bargaining and ESA by preparing an ESA National Salary Directory for distribution to colleges.
- Approved the idea of permitting ESA membership on an individual as well as a unit or company basis as at present—a move that must be delayed a year because of the necessity of amending the ESA constitution.

• Firmly but politely, "No"—Delegates voted 46 to 4, with five abstentions, against a resolution calling for affiliating with AFL-CIO as an autonomous union. The alternative of merging with the American Federation of Technical Engineers did not come to a vote. ESA leaders already had politely rejected this proposition in discussions with members of AFTE's executive board, also meeting in Dallas, at a social gathering on the opening day of the ESA convention.

Although most delegates conceded that either of the AFL-CIO connections would give ESA much greater bargaining power, they expressed belief that the gain would be more than offset by loss of professional standing.

ESA's president, Joseph Amann, referring to the proposed merger with AFTE, noted that 85% of ESA's members are graduate engineers, while 75% of AFTE's members are technicians, such as draftsmen.

• The drive for civils—Explaining the emphasis to be placed on civil engineers in current organizing drives, John Taft of Washington, D. C., outgoing ESA vice-president declared: "Civil engineers, as a group, are the lowest paid engineers in the country. They need the benefits of collective bargaining more than engineers in any other classification."

It was disclosed that ESA currently represents 1,100 civil engineering employes of the Pacific Gas & Electric Co., and 180 civil engineers employed by firms in the Western Assn. of Engineers, Architects and Surveyors.

• The matter of salary—Behind the decision to budget funds for salary research and publicity aimed at engineering graduates was an ESA committee report contending that opportunities and pay for graduate engineers are not as good as industry says.

Amann, who was re-elected for another term as ESA president, declared that while starting salaries for engineers average around $400 per month, there is little room for financial advancement in the years to come under the present situation. "Twenty-year men, he contended," are getting only an average of 1.8 times the current starting salary of $400."

It is the ceiling placed on veteran engineers in government service that prompted the resolution calling for a separate classification for federal engineers. ESA's resolution noted that the federal job classification system is designed primarily for people in clerical and administrative positions, and imposes specific limits with respect to salary and advancement opportunities.

• Future strategy—Adoption of the individual membership policy next year is considered a key factor in ESA plans for intensifying its recruiting activities.

ESA's budget also is indicative of the stress to be put on recruiting in the months ahead.

It was disclosed that ESA now bargains for approximately 40,000 engineers and scientists, of which about half are ESA members.

"Organization of engineers and scientists has become necessary," in the words of delegate E. T. Darby of Camden, N. J., "because of the heavy use of graduate engineers and scientists in industry."

"Industry 20 to 25 years ago used one engineer for every 250 workers, and engineers and scientists were then very close to top management personnel, and their abilities were keenly appreciated. Now, there is about one engineer for every 10 to 25 workers. Consequently, though his work is still vital, he has become just another cog in the wheel."

In other words, contended Darby, engineers generally have become separated from top management, so that their prestige with their employers has diminished and their chances of getting paid what they're worth have lessened.

• New officers—Besides re-electing Amann as president, the ESA delegates chose these officers for the coming year: Albert Orth Jr., of Chicago, vice president; Louis Wilton of Los Angeles, secretary; and John Moran, Camden, N. J., treasurer.

Coliseum Completed in Two Years

Right on schedule, the $35-million New York Coliseum, in midtown Manhattan, will be opened April 28—two years after start of work. Actually three buildings in one, it consists of a basement parking garage, four-story exhibition hall and 20-story office tower atop the exhibits (ENR Jan. 5, p. 34). Leon and Lionel Levy are the architects. The project was constructed by a joint venture of George A. Fuller Co., Walsh Construction Co. and Slattery Contracting Co.

GULF PRODUCTS *and* FINE SERVICE
keep equipment rolling
on Massachusetts Dam Project

Daniel O'Connell's Sons, Inc., Holyoke, Mass., have the contract for the new Manham Dam at Southampton, Mass., which is being constructed for the City of Holyoke, Mass. The photo was taken from the top at one end of the dam, which will be approximately 2000 feet long.

LIKE other leading contractors, Daniel O'Connell's Sons, Inc., are mighty careful about controllable costs, particularly maintenance expense.

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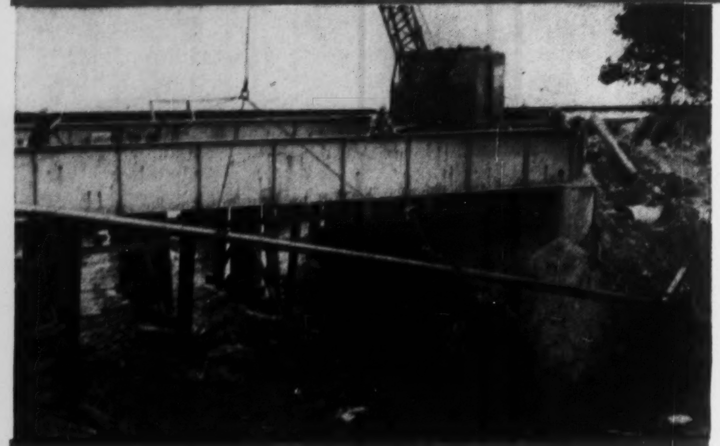

Installing 6-inch Mechanical Joint cast iron pipe for pressure sewer river crossing to sewage treatment plant at Marquette, Mich.

If you were to put *your own money* in a pipeline that should be as nearly permanent as brains, hands and machines could make it, what pipe would you buy? Cast Iron Pipe, undoubtedly! And why? Because cast iron mains are in their *second century* of service in nearly *seventy* cities. *Modernized* cast iron pipe, as made today, is even tougher and stronger. Since everybody pays taxes, one way or another, everybody benefits when you install long-lived cast iron pipe. For further information, write Cast Iron Pipe Research Association, 122 So. Michigan Avenue, Chicago 3.

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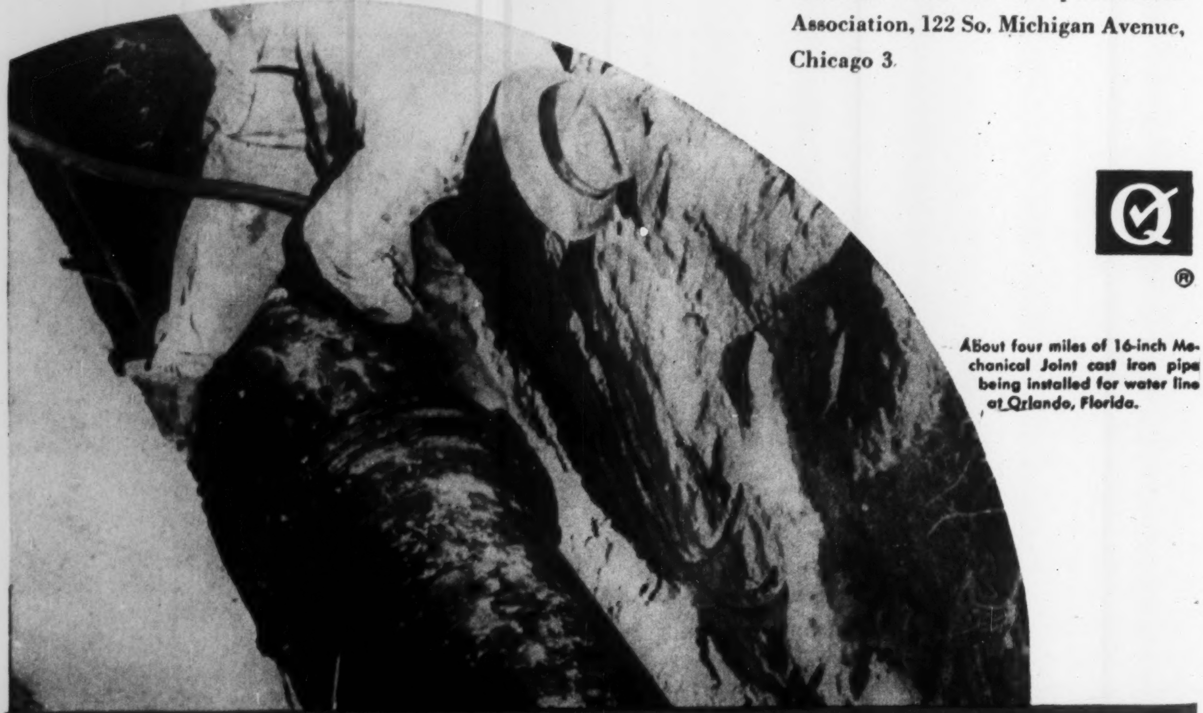
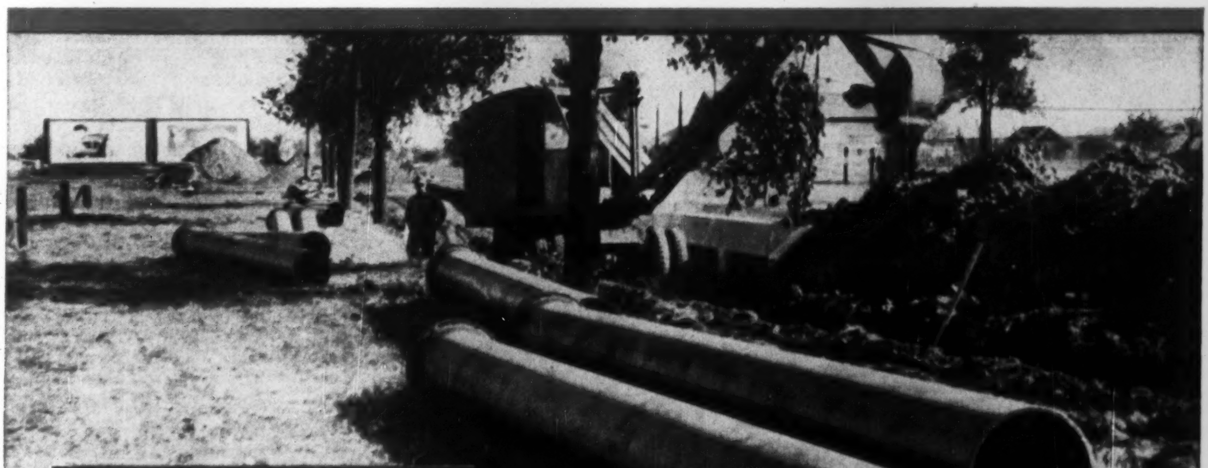


About four miles of 16-inch Mechanical Joint cast iron pipe being installed for water line at Orlando, Florida.

CAST IRON PIPE

everybody benefits!



Laying 16-inch cast iron pipe for water line to new Caterpillar Tractor Company plant at Decatur, Illinois.

Tieing-in 16" Cement-lined cast iron feeder main with 133-year old cast iron water main in Philadelphia.

Laying 21,000 feet of 6" to 12" cast iron pipe for water main extension at North Brunswick Township, N. J.

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Photo courtesy of Harnischfeger Corp.

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TV Traffic Aid

Philadelphia to use TV to prevent traffic snarls

Following the lead of several other cities—notably Chicago, Detroit and New York—Philadelphia traffic officials are drafting plans to use closed-circuit television as an aid to unsnarling downtown traffic.

The need for some such supervision of traffic came to the fore after the Philadelphia Transportation Co. announced a plan to replace trolleys with buses on two congested downtown streets. Police planned to designate special lanes for exclusive bus use during rush hours, but then considered the possibility that a few parked cars could completely tie up the mass-transport units.

The answer seemed to be television, which would provide monitoring from a central point of the area and permit an operator to call a tow-truck or police—by radio.

The Jerrold Electronics Corp. of Philadelphia, is working with city officials to set up a group of TV monitors —a total of 12 cameras—to keep the downtown area under surveillance. It is estimated that the city will spend between $100,000 and $200,000 for a pilot installation.

Railroad Will Build Another Pipeline Along Right-of-Way

The Southern Pacific Railroad, having completed its $34-million California-to-Texas oil pipeline (ENR, Mar 3, 1955, p 68) early this year, has announced a new pipeline project between San Francisco Bay refineries and Reno and Fallon, Nev.

Like the present pipelines, the new $16-million project will be installed almost entirely along Southern Pacific right-of-way. Surveys and engineering studies are now being made by Southern Pacific Pipe Line, Inc., a wholly-owned subsidiary of the railroad company.

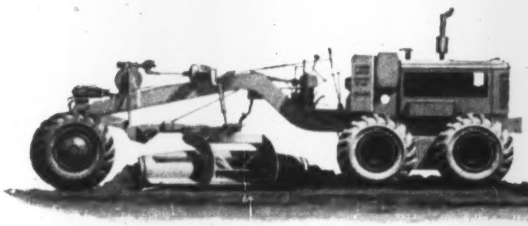
Highway Spending in Montana May Hit $24 Million in 1956

Montana highway commissioners have awarded twelve road and bridge contracts totaling $2,599,383, kicking off what is expected to be the state's biggest year in highway construction. Commissioners estimate that they will spend $24 million during 1956.

Three more projects, still under consideration for inclusion in this first bid letting, could add more than $300,000 to the March total.

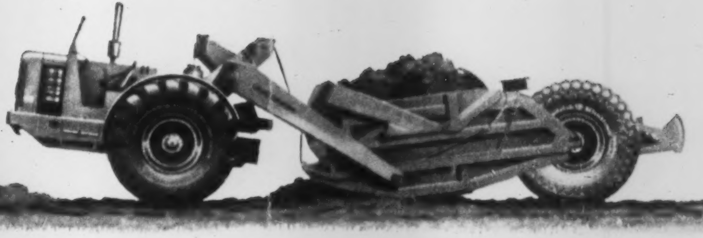
Last year the commission awarded a record $19,368,871 in contracts.

B.F.Goodrich Parade of E



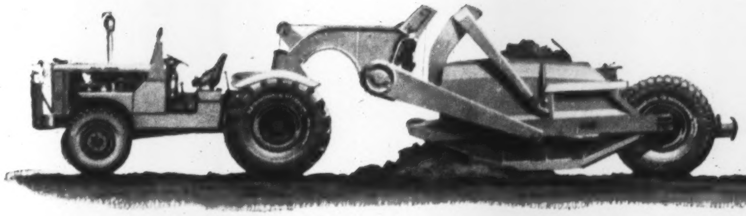
The **Adams** No. 660 Diesel Motor Grader has 8 forward speeds up to 26 miles per hour, 4 reverse speeds up to 13.7 miles per hour. Unit rolls on 14.00-24 Tractor Grader Lug tires.

The body of this **Dart** Model 10-S truck rises to a height of 18 feet in dumping position, dumps at a 60-degree angle. Unit comes equipped with B. F. Goodrich Universal tires.

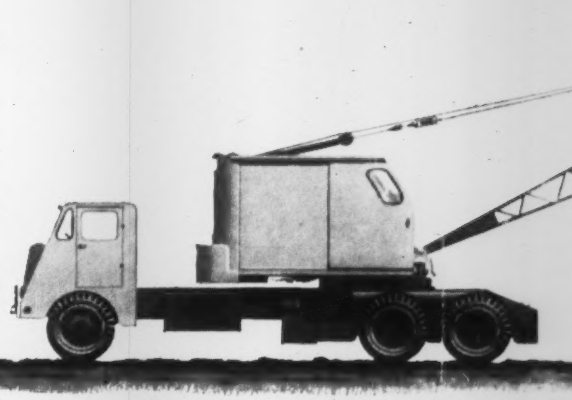


Double-Safety air brakes, selective-speed steering, direct electric starting and multiple-disc cable control are among the features of the **Allis-Chalmers** TS-360 Motor Scraper.

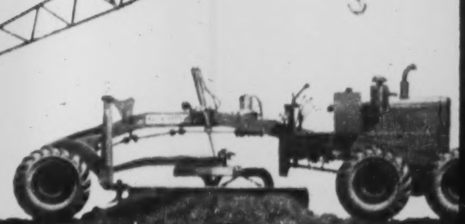
Attachments for the **Le-Tourn**
house Model C Tournatractor
er (above), logging winch, tree
V-type snow plow, root rake



Caterpillar DW15 tractor with matched No. 15 scraper has 150-horsepower engine. Tires shown are B. F. Goodrich Ribbed Universal (front), Super Traction (drive), Earth Mover Traction (scraper).

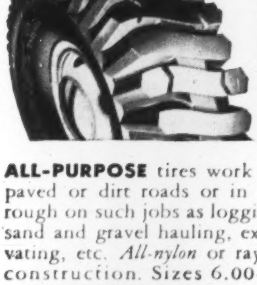


Bay City CraneMobile may be used as crane, clamshell, dragline or pile driver. Maximum lifting capacity 25 tons. Will handle booms up to 110 feet plus 30-foot jibs.

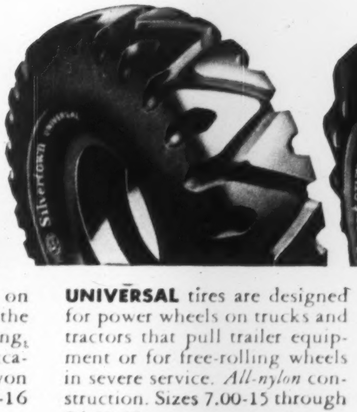


Austin-Western Super 99 Power Grader features 6-wheel drive and 6-wheel steering. Blade rotates 360° and raises 90° right or left. Tires are 13.00-24, 10 ply low pressure.

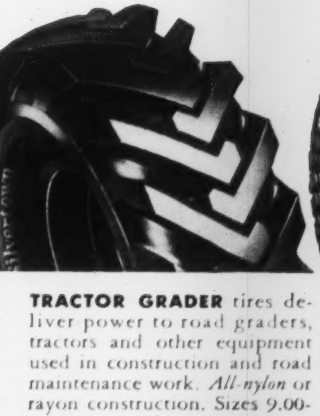
These B. F. Goodrich tires keep construction



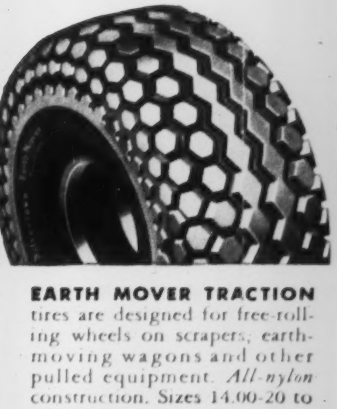
ALL-PURPOSE tires work on paved or dirt roads or in the rough on such jobs as logging, sand and gravel hauling, excavating, etc. *All-nylon* or rayon construction. Sizes 6.00-16 through 12.00-24.



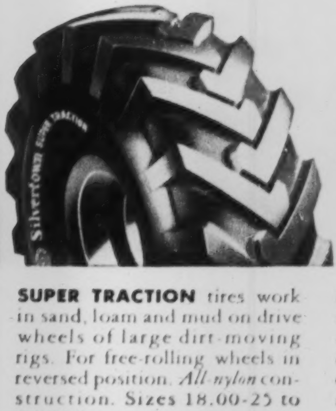
UNIVERSAL tires are designed for power wheels on trucks and tractors that pull trailer equipment or for free-rolling wheels in severe service. *All-nylon* construction. Sizes 7.00-15 through 24.00-29.



TRACTOR GRADER tires deliver power to road graders, tractors and other equipment used in construction and road maintenance work. *All-nylon* or rayon construction. Sizes 9.00-24 to 18.00-26.



EARTH MOVER TRACTION tires are designed for free-rolling wheels on scrapers, earth-moving wagons and other pulled equipment. *All-nylon* construction. Sizes 14.00-20 to 24.00-29.



SUPER TRACTION tires work in sand, loam and mud on drive wheels of large dirt-moving rigs. For free-rolling wheels in reversed position. *All-nylon* construction. Sizes 18.00-25 to 24.00-29.

ROCK LOGGER
for drive and fro
dump and logg
cement mix truck
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nylon construction
20 to 14.00-24.

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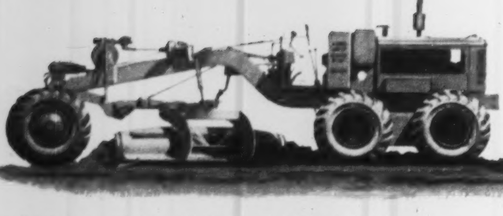

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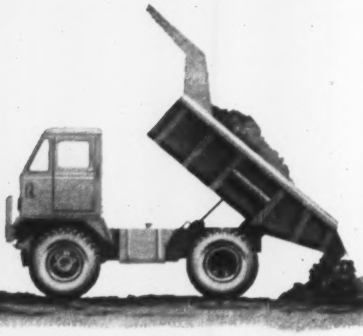

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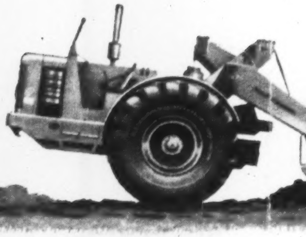

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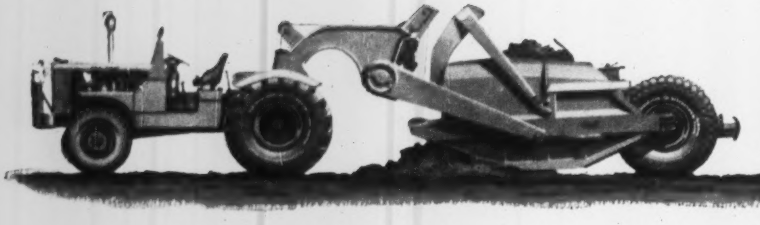

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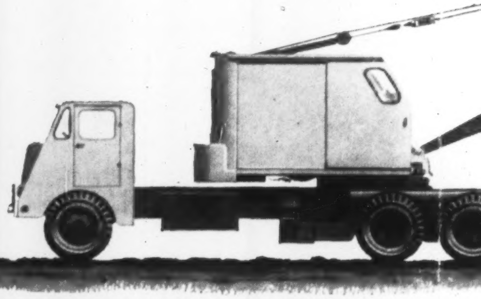

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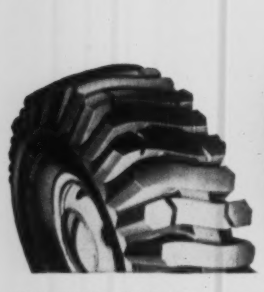

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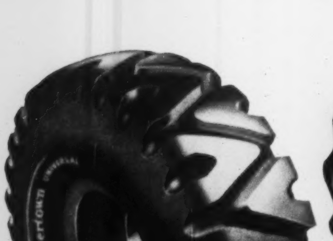

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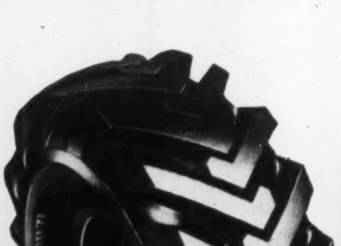

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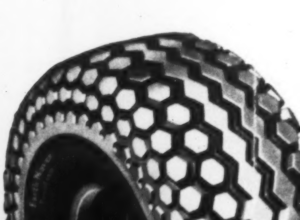

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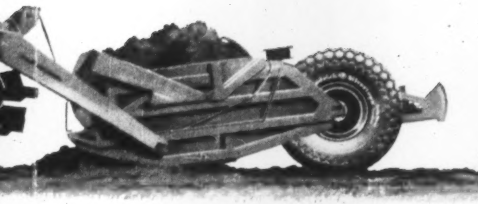
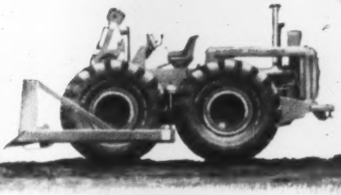
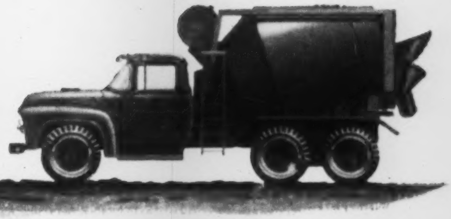


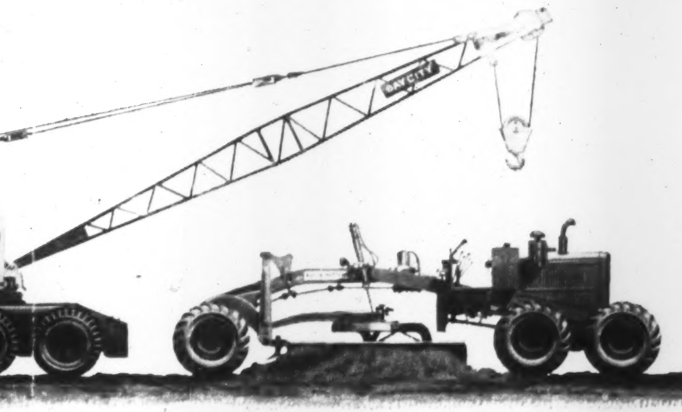


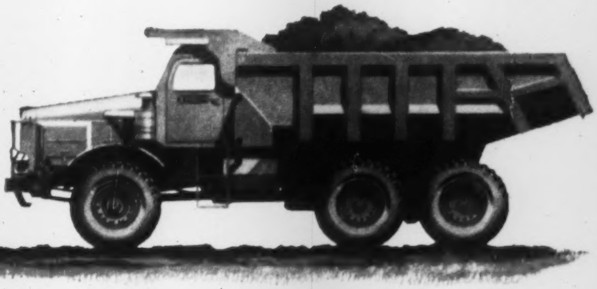


r brakes, selective-speed steer-
ric starting and multiple-disc
e among the features of the
TS-360 Motor Scraper.

Attachments for the **Le-Tourneau-Westinghouse** Model C Tournatractor include bulldozer (above), logging winch, tree stinger, scraper, V-type snow plow, root rake and angledozer.

Tubeless tires, power steering and tachometer are standard equipment on this **Ford** transit mix truck in the T-800 series. You have choice of 190-h.p. or 200-h.p. Y-block V-8 engine.





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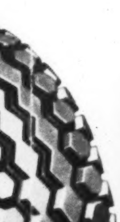
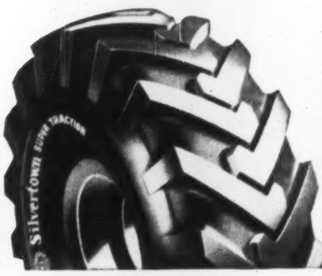
Austin-Western Super 99 Power Grader features 6-wheel drive and 6-wheel steering. Blade rotates 360° and raises 90° right or left. Tires are 13.00-24, 10 ply low pressure.

B. F. Goodrich Universal tires are shown on this **Euclid** Model FFD 34-ton rear-dump truck. Capacity is 28 cu. yds. heaped for payload weight of 68,000 lbs.

keep construction work rolling





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SUPER TRACTION tires work in sand, loam and mud on drive wheels of large dirt-moving rigs. For free-rolling wheels in reversed position. *All-nylon* construction. Sizes 18.00-25 to 24.00-29.

ROCK LOGGER tires are built for drive and front wheels on dump and logging trucks, cement mix trucks, quarry and construction machinery. *All-nylon* construction. Sizes 8.25-20 to 14.00-24.

SPECIAL compounding for extra toughness, special tread designs for every kind of work, special *all-nylon* cord bodies that outwear even the extra-thick tread and can be recapped over and over—these are some of the advantages B. F. Goodrich builds into its off-the-road tires. If you want lower operating costs and longer, trouble-free tire service, see your B. F. Goodrich retailer today. On-the-job service is available coast to coast from B. F. Goodrich retailers. *The B. F. Goodrich Co., Tire & Equipment Div., Akron 18, Ohio.*

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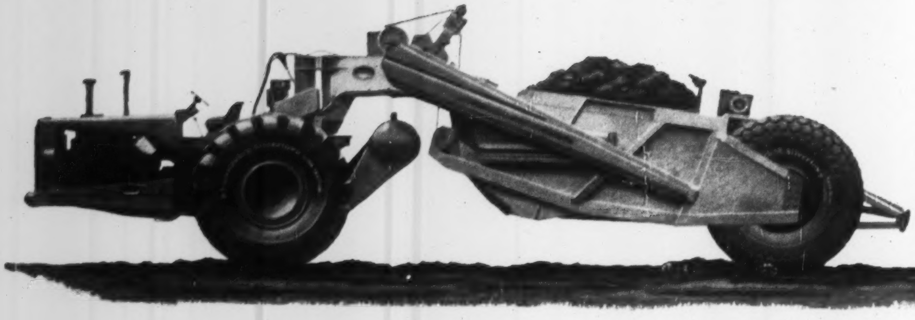
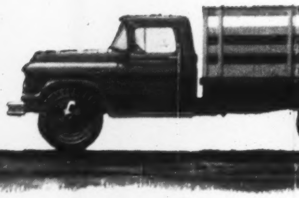
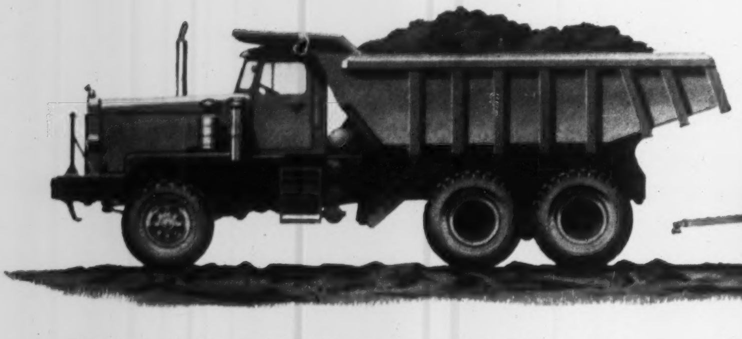


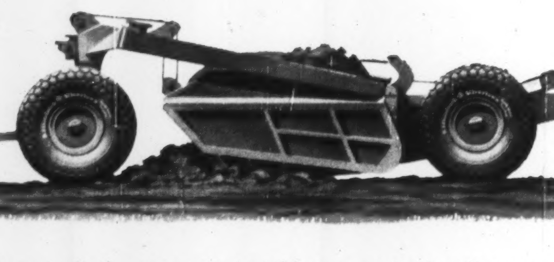
LeTourneau-Westinghouse Model B Tournapull and Model B Scraper measure 40′-6″, tower 12′-7″. Tournapull can make 90° left and right turns. Scraper holds 25 cubic yards heaped. Tires shown are B. F. Goodrich Super Traction on drive wheels and Earth Mover Traction on trailing wheels.



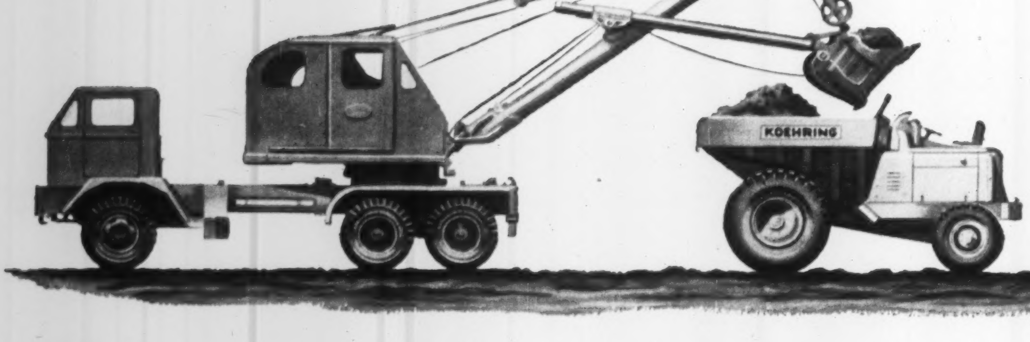
Chevrolet Task-Force stake truck Model 6409 ca load of 13,300 pounds in a load space measuring B. F. Goodrich All-Purpose tires are designed fo truck that does a variety of on and off-the-road



This massive **Mack** LRVSW dumper is designed for mining, stripping and earth-moving projects. 30-ton payloads roll on such tires as the B. F. Goodrich Rock Logger and Universal. Diesel engine develops 400-h.p.

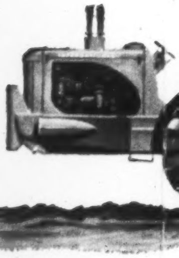


Oliver 4-wheel, open-top twin-cable scrapers in the 4C series have a cutting blade up to 113″ long, can carry up to 17.5 cubic yards of dirt.



Michigan Model TMDT-16 is a general purpose 12½-ton excavator-crane fully convertible to all standard front end attachments. The boom is 17′-3″ long, has a diameter of 12¼″.

Koehring Dumptor unloads 16,500-lb. payload in one second. No turns are necessary at shovel or dump because speeds are the same in forward or reverse.



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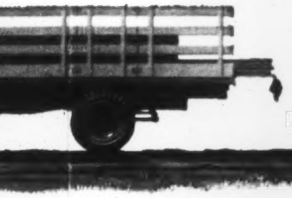

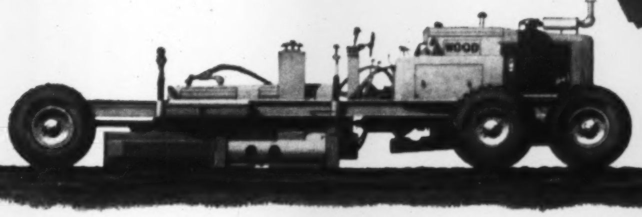

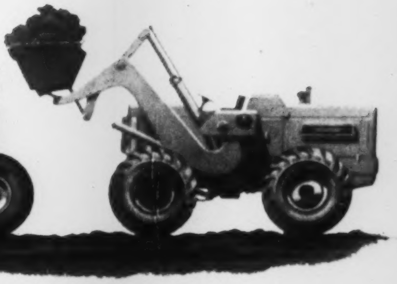

l 6409 carries a pay-
asuring 144" x 85".
igned for this type
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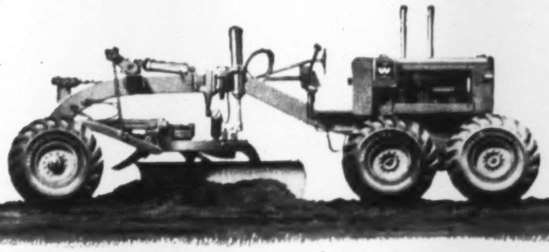
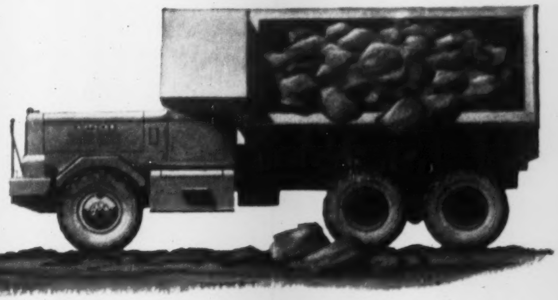
Up to ¾ of a mile of 24-foot roadway, 3" thick, can be produced by the **Pettibone Wood** Model 42 Roadmixer in an 8-hour day. This machine mixes cement or asphalt for highway, airport or parking area construction.

The bucket of this **Hough Payloader** raises to a maximum height of 16'-1" from a digging depth of 12" below the ground. Four-wheel drive, with 14.00-24 tires, provides maximum traction.





series
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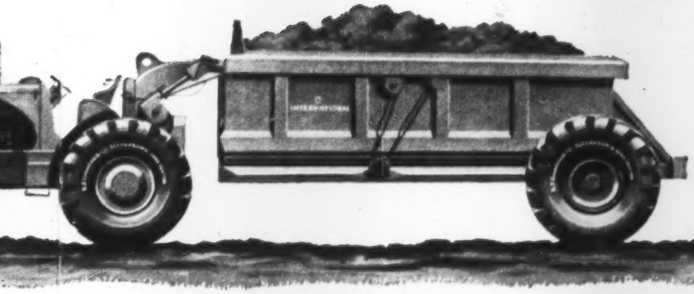
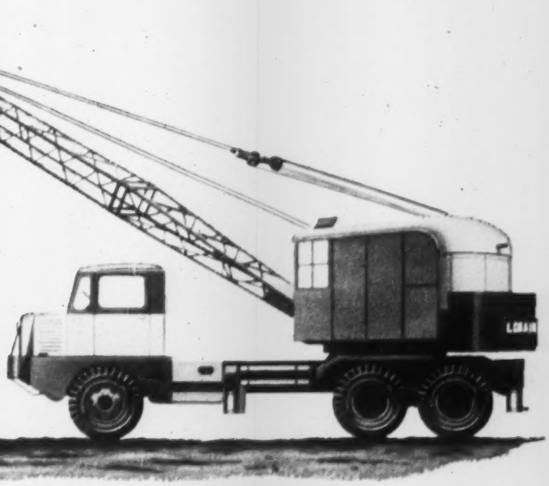
Grading, maintenance, snow removal, scarifying, bank sloping and ditching are just a few of the jobs for which **Huber-Warco** motor graders are designed.

Side-dumping **White** Autocar DC-10364S-OH carries a truck load of 12 cubic yards. Truck weighs nearly 22 tons, rolls on 10 B. F. Goodrich Rock Logger tires.



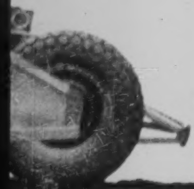


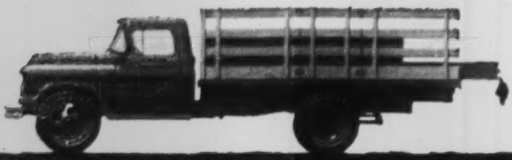
Haul-road speeds up to 24 mph, fully loaded, are a feature of the **International** Model 75 Paywagon. Tires are B. F. Goodrich Super Traction.

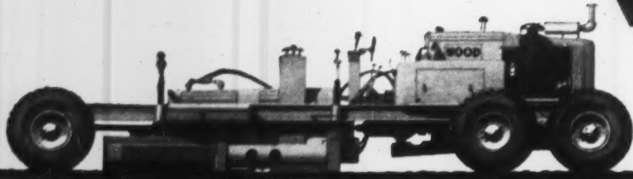
Thew Shovel's Lorain MC-524 Moto-Crane handles everything from loading logs to erecting steel.

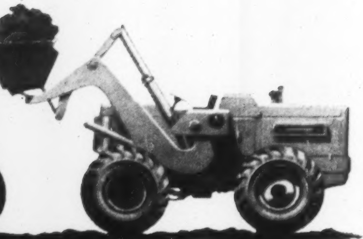
Lift Page ➡

tires handle the big, tough jobs









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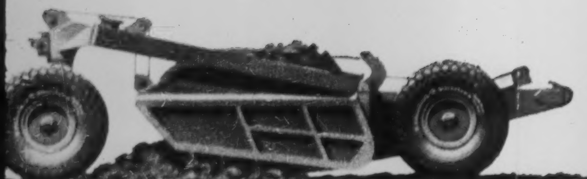

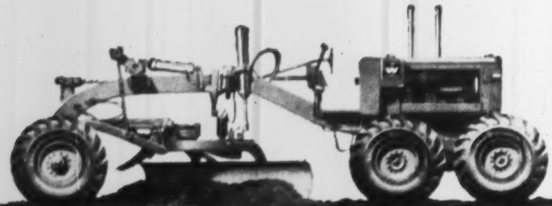

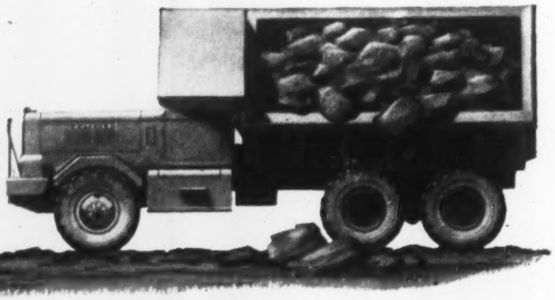

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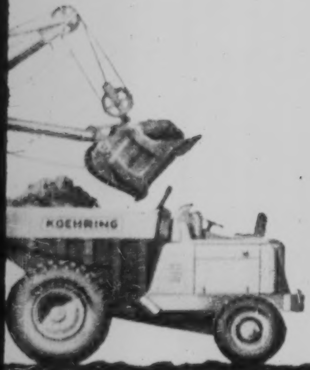

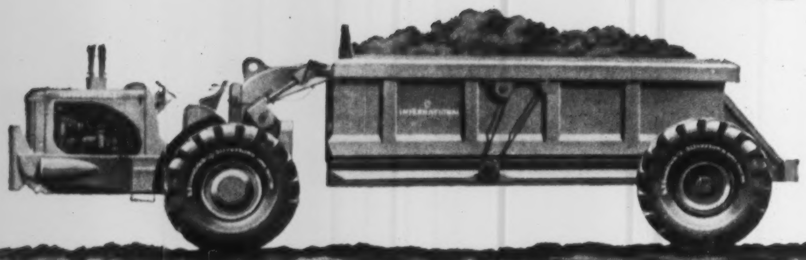

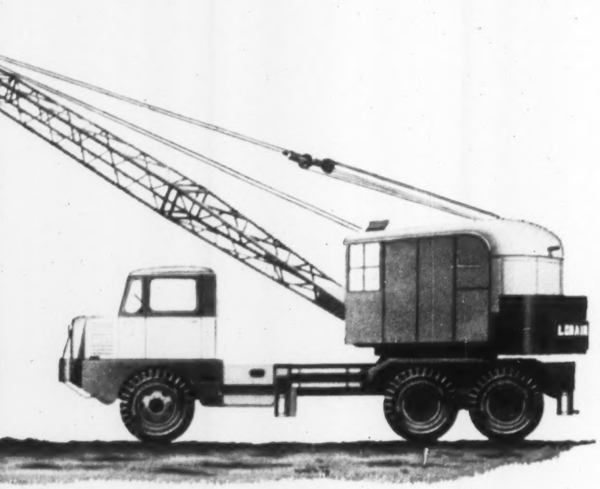

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Lift Page ➡

Squeezing More Out of School Dollars

The White House conference committee's report to the President this month emphasized again the seriousness of overcrowding in schools. The report pointed up the fact that with federal aid still bogged down in Congress, most communities have no alternatives but to continue to cut corners and stretch every dollar they can raise into the most school plant in the least possible time. Moreover, that this is also a situation that must be faced for many years to come is made strikingly plain by an estimate of enrollment figures given on page 117 of this issue.

To find out how schoolhouse designers and builders are meeting the challenge, ENR made a random check and found the problem being attacked vigorously with a wide range of techniques. They are incorporating portability, flexibility and expandability; shaving building area and height; shortening corridors; using prefabrication and modular construction; making multi-purpose use of space; relying more on natural lighting; and eliminating frills.

• **Classrooms follow pupils**—For instance, to complicate the usual problem of overcrowded schools in Dearborn, Mich., population studies showed the classroom shortage would be partly transient, with newcomers settling for a few years in some areas and then moving to others. Foreseeing the high cost of leaving a trail of no-longer-needed schools in the wake of this phenomenon, the authorities decided to head it off by building portable schools.

To get the needed mobility without resorting to dismantling (and its high labor cost), Eberle M. Smith Associates, Inc., Detroit architects, came up with a 30x68-ft, two-classroom unit that can be jacked up intact from expendable concrete foundations, lowered on wood skids and hauled to a new site.

The two 15-ft-wide barrel segments that roof each unit are stressed-skin shells, composed of two layers of ⅜-in. plywood and a core of 2x4 spacers. Acoustic tiled on the ceiling side, insulated and roofed on top, the segments rest on curved 15-ft glue-laminated wood arches, which bear on pipe columns. Framed between the columns are insulated aluminum wall panels and wood sash. Outside finish is ribbed aluminum siding. Floors are plywood on wood joists, placed on the steel frame base. Each two-room unit has a core of toilets, classroom wash basins and an oil-fired warm-air furnace.

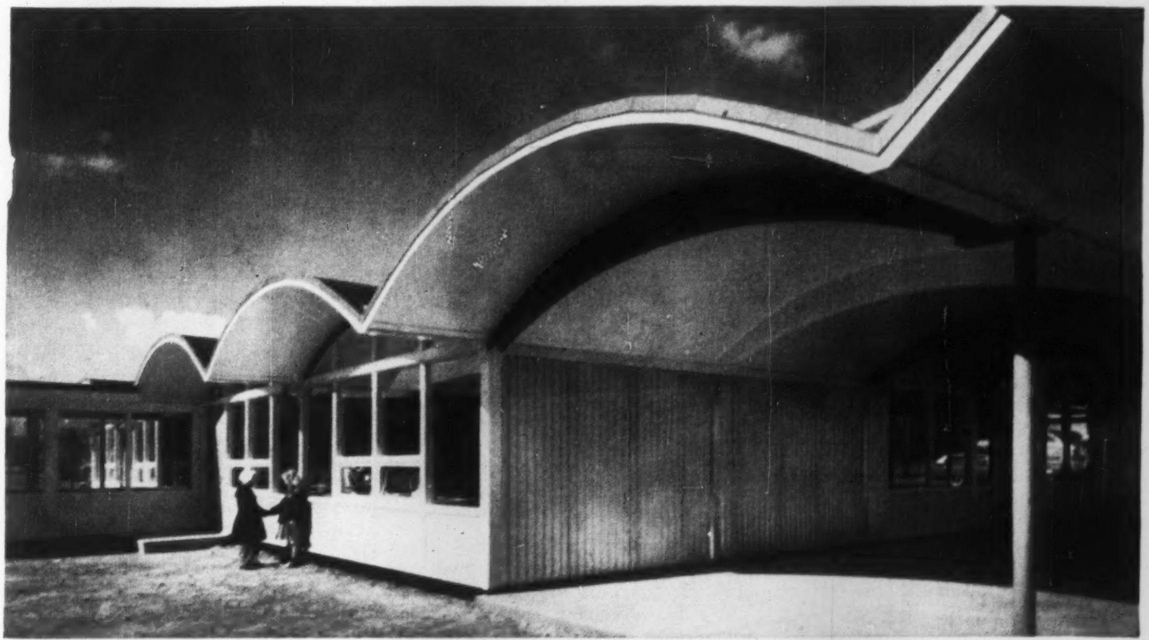
The first units built cost $17 per sq ft, but re-use of jigs for the roof shells will cut future costs.

• **Prefabs went up fast**—Speed, rather than mobility, called the play in Lafayette, Ind. Using prefabricated buildings, the contractor for Edgelea School completed the first four two-room units 2½ months after starting foundation work.

Cost was about $13.65 per sq ft, including utility cores of washrooms, individually controlled warm-air furnaces, classroom wash counters and drinking fountains. Cement-bonded wood-fiber roof-deck panels, exposed inside, serve also as insulation and acoustical ceiling. Roof framing is exposed glue-laminated wood beams. National Homes Corp. supplied the prefabricated parts.

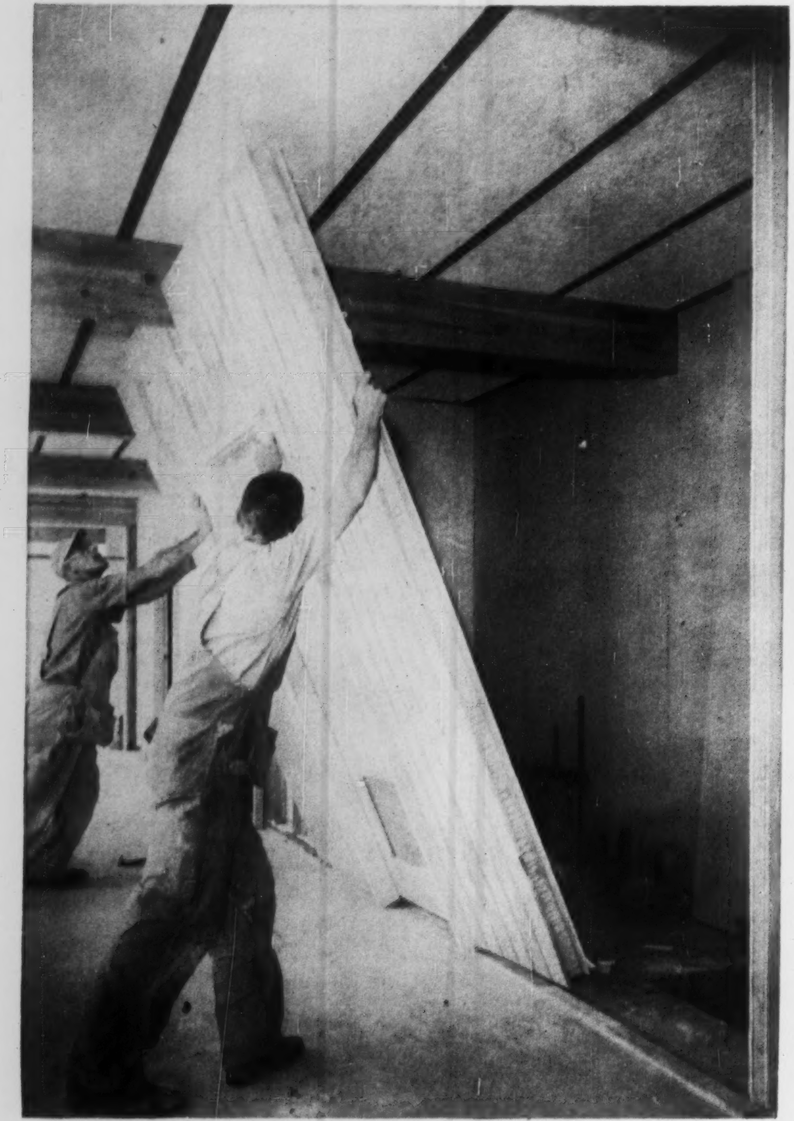
Prefabricated elements also cut site work on a new gymnasium in Paoli, Pa. Wall finish—inside and out—and insulation are built-in features of the sandwich panels used. The panels consist of vari-colored, 16-ga, porcelain-enameled steel sheets enclosing a core of cement-wood-fiber. H. L. Shay and Associates, architects, Philadelphia, designed the building.

In another application of prefabricated components, light-steel space frames were used to frame the floors, walls and roof of 5-room, 120-pupil Monroe Elementary School in Wayne, Mich. The various parts were designed to premit future dismantling. Again, cement-wood-fiber roof-deck panels

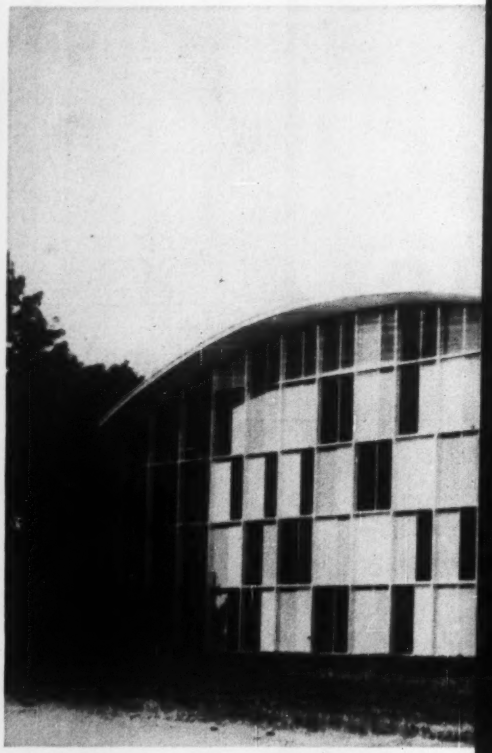


CUT SCHOOL COSTS with portable classrooms. Dearborn, Mich., solved problem of area shifts in school enrollment by building two-room units that can be jacked up intact and towed on skids to new sites.

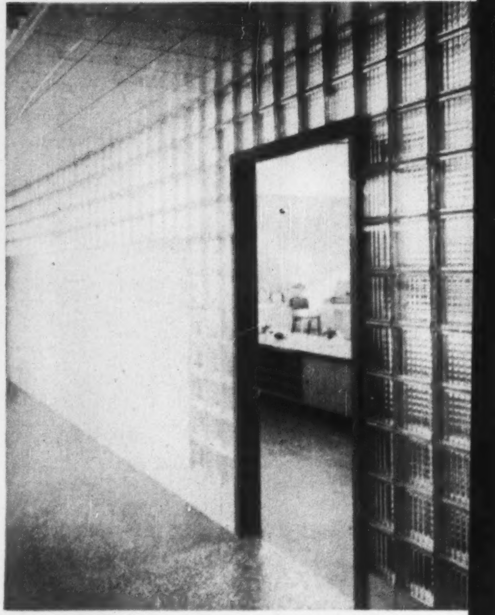
Cut School Costs by . . .



. . . PREFABRICATING BUILDINGS Factory-built components can also save time. Four two-room units of Edgelea School, Lafayette, Ind., were completed in 2½ months. Glue-laminated wood beams frame the roof.



. . . PRE-FINISHING WALLS Sandwich panels in gymnasium wall at-



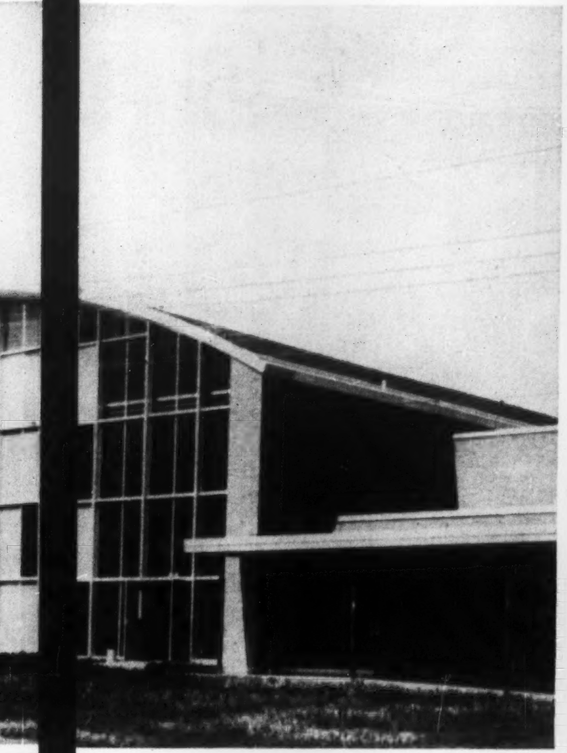
. . . USING GLASS BLOCKS Halls borrow light from classrooms in this Fairport, N. Y. school.

meet insulation and acoustical needs. Completed cost of the building was $13 per sq ft.

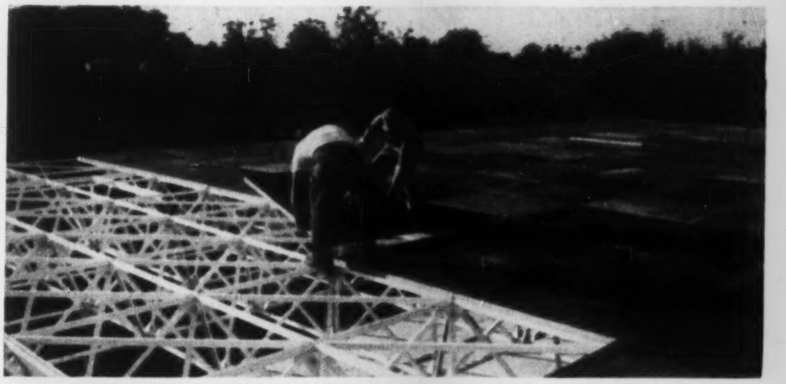
Prefabrication scored again when precast, prestressed concrete roof slabs were credited with a sizable saving in a 16-room, 42,000-sq-ft elementary school built in Jacksonville, Fla. The cost per square foot of the new school —including $0.90 per sq ft for the roof slabs—was $8.47, against the recent Duval County average of $9.25. And because this was a first-time job for the slab operators, even bigger savings may be possible in the future, according to Albert R. Broadfoot, supervising architect for the Duval County Board of Public Instruction.

The school was designed by George R. Fisher and Harry E. Burns, Jr., architects, and built by D. F. McMains & Sons, of Jacksonville.

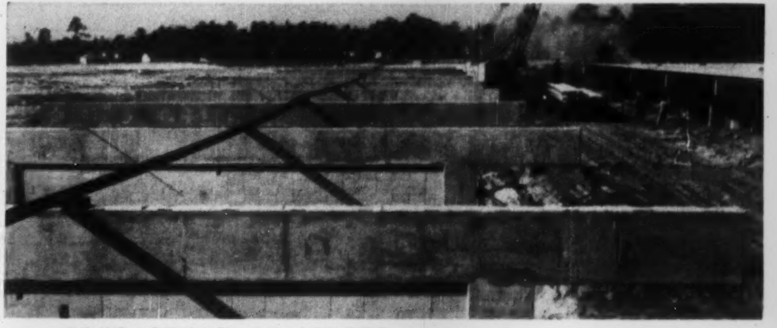
• Daylight costs nothing—Low light bills and fewer luminaires were the aims of Benedict M. Ade, architect, when he designed Johanna Perrin Elementary School, Fairport, N. Y. He provided four courses of glass blocks as the upper one-third of the walls between classrooms and corridors. The blocks admit light from classrooms to corridors and reduce hallway luminaires but preserve classroom privacy.



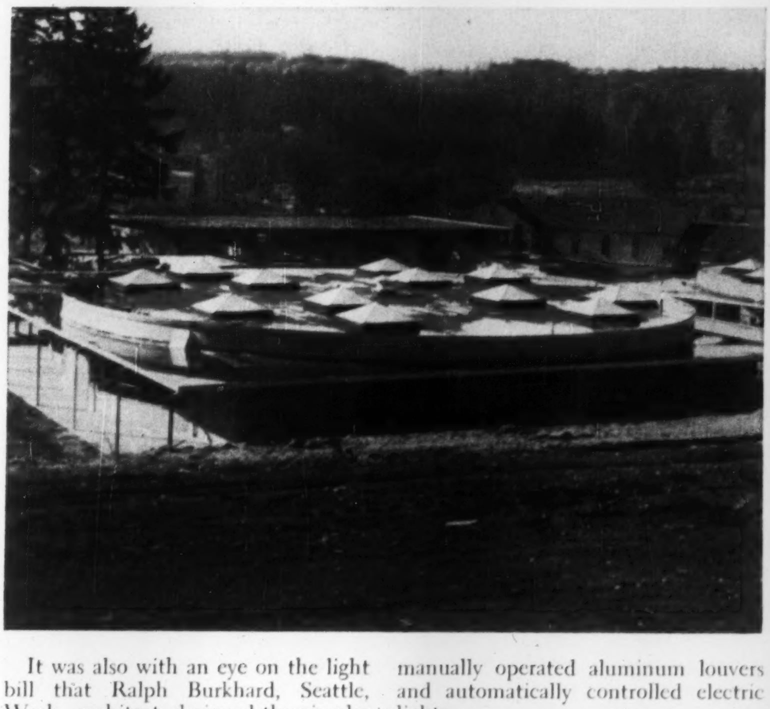
Paoli, Pa., are faced with blue, yellow and black porcelain-enameled steel.



. . . PREFABRICATING THE FRAME Demountable space frames of light steel were used for roof, floor and walls of school in Wayne, Mich.



. . . PRECASTING CONCRETE Precast, prestressed slabs trimmed cost of school in Jacksonville, Fla., $0.78 per sq ft below county average.



. . . DAYLIGHTING Plastic pyramids (left) atop circular school building near Seattle, Wash., and plastic diffusers (above) at ceiling level admit daylight to pie-slice-shape classrooms. Louvers and electric lights above diffusers maintain correct brightness.

It was also with an eye on the light bill that Ralph Burkhard, Seattle, Wash., architect, designed the circular classroom buildings for May Valley Elementary School, near Seattle. In each of the 75-ft-dia buildings, he provided twelve 6x6-ft skylights, with manually operated aluminum louvers and automatically controlled electric lights.

Louvers and artifical light sources are located above translucent, glass-fiber-reinforced plastic diffusers at ceiling level. Pyramidal skylights—also plastic—cap the roof openings. Louvers regulate natural light, but when brightness falls below the required level, photo-electric cells switch on four 300-watt bulbs in each skylight. The skylights also admit enough solar heat to cut fuel bills.

Also aimed at economy are the cir-

Cut school costs by . . .

cular walls. They enclose more space than rectangular walls of the same length. Besides four of the circular buildings—each of which contains four pie-slice shaped classrooms and a utility core—the May Valley project includes an administration building and a 78x49-ft multi-purpose building. Triangular, 22-ft-high translucent plastic inserts form about half of one wall of the multi-purpose building. Tilt-up concrete slabs were used for the other three walls.

The project cost $12.37 per sq ft. Structural engineer was Peter Hostmark of Seattle.

• **Low beams dropped cost**—Wall savings—in height rather than length—keyed the economy effort in Levittown, Pa. School officials say the new $599,000 Samuel Everitt School came in at lower cost than any publicly bid school built in Bucks County, Pa.—and probably in the whole state—since World War II.

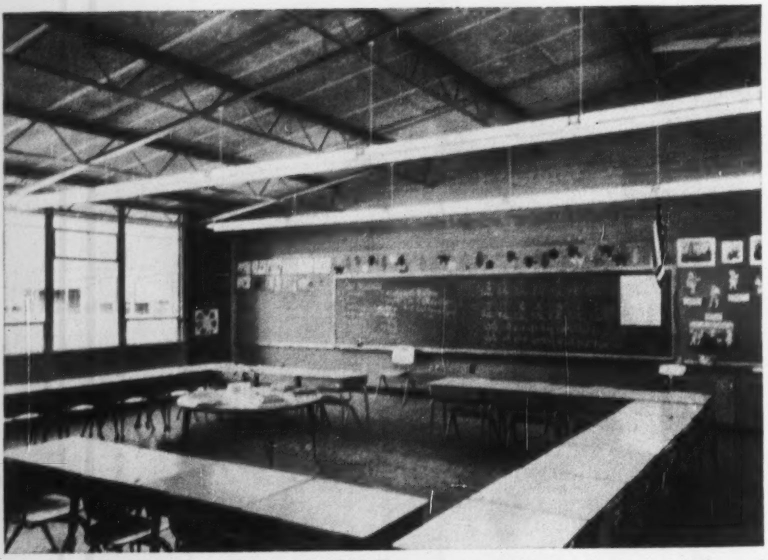
How did they do it? Haag & d'Entremont, architects of Jenkintown, Pa., say they made the biggest dent in the price by allowing the steel roof framing to project down into room space. State approval was necessary before they could measure clear ceiling height to the underside of the exposed cement-wood-fiber roof deck (instead of to the bottom of the steel); but once approval was granted, they lowered the walls and skimmed 30,000 cu ft off the top of the building. Then, instead of ignoring the exposed steel, they brought it into the decorating scheme.

Among other cost-saving features listed by the architects: Use of square classrooms (30x30 ft instead of the conventional 22x38 ft) shortened corridors; corridor skylights reduced artificial lighting; asbestos-cement panels for exterior classroom walls and plain limestone block for corridor walls cut masonry costs; hot-water heating proved cheaper to install (and will be cheaper to operate) than forced hot air.

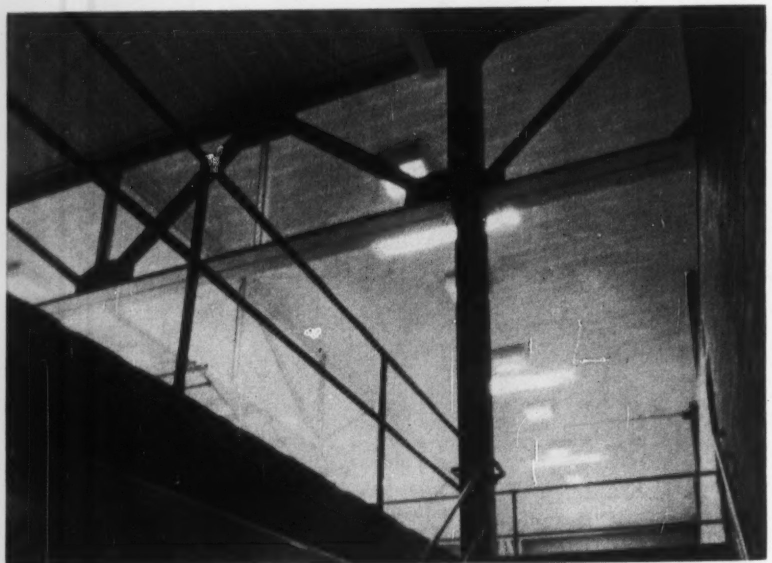
The project includes 20 classrooms, administrative and health offices, an auditorium and gymnasium-cafeteria. At $11.71 per sq ft, the cost per pupil was $775—$325 under the maximum the state will repay. The cost includes $55,000 for the 17-acre site. General contractor was John E. Rafferty, Jr., Inc., Philadelphia.

• **Modular design helps**—Exposed steel is also a feature of the Seymour, Wis., high school, but it is only part of the low cost story. Lawrence Monberg & Associates, architects of Kenosha, Wis., credit a basic design that they have proved over and over with the same type of materials. Other features of the Monberg system include: modular design; perforated steel roof panels which insulate and serve as acoustical ceiling; elimination of outside wall returns (it costs $300 to turn a corner, says Monberg partner Oscar Andersen); interior bearing walls (foundations are free from frost action and can, therefore, be shallow); square classrooms (shorter corridors and more room area per foot of wall); uniform classroom size; and one-story construction.

Latest reports on bid prices for school buildings show a sharp upturn since the middle of last year. After a period of stability from the beginning of 1954 to mid-1955, construction costs have been rising steadily through the first quarter of this year—and there's no reason to expect a break in this trend. These reports point up the necessity of using every available technique to get more for the building dollar.



. . . EXPOSING ROOF INSIDE. This feature helped keep cost of Samuel Everitt School, Levittown, Pa., below that of neighboring schools built recently.



. . . EXPOSING STEEL. Roof beams and cellular steel roof are exposed throughout school at Seymour, Wis. Insulation-filled roof panels control sound.

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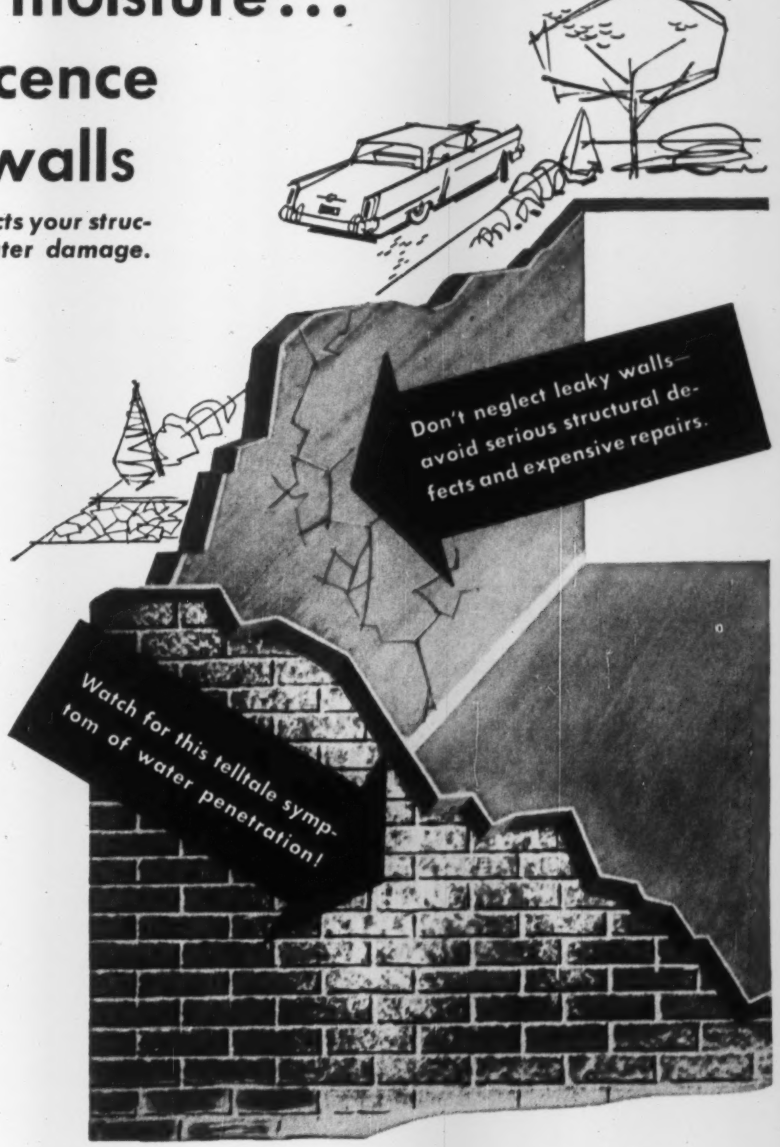
Silicone base water repellent protects your structures from inside and outside water damage.



Don't neglect leaky walls—avoid serious structural defects and expensive repairs.
Watch for this telltale symptom of water penetration!

Dehydratine No. 22 is no ordinary "surface" repellent. It functions on the principle of "negative capillarity" *in depth.* The highly penetrating characteristics of Dehydratine No. 22 set up a valve-like action within the masonry that permits vapor to escape *outward,* but stops the capillary absorption of solid drops of moisture from passing inward.

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Engineer & Builder:
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229,000 Sq. Ft. of Cofar on Wheeling's Wharf Municipal Parking Deck. 3½" concrete slabs, on spans of 6'9", were used on this job now under construction.

Cofar® concrete slabs make

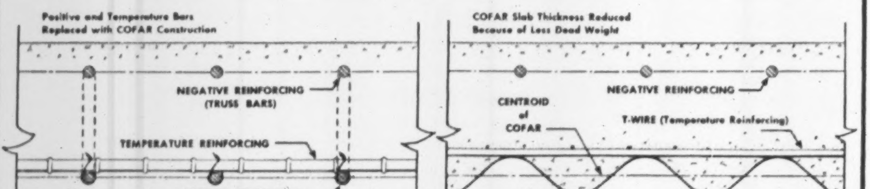
Money-saving Cofar combines form and reinforcing into one quick and simplified operation for floor construction

Cofar is making huge savings for designers, contractors and owners of parking decks. By combining form and reinforcing operations into one quick step, Cofar cuts out the time, material and money normally expended in old-fashioned form work.

Cofar is deep-corrugated, high-strength galvanized steel with heavy wires welded across the corrugations. The units make a tight form for wet concrete and provide the main positive reinforcement when concrete has set. The transverse wires supply temperature reinforcement and interlock the concrete to the steel units.

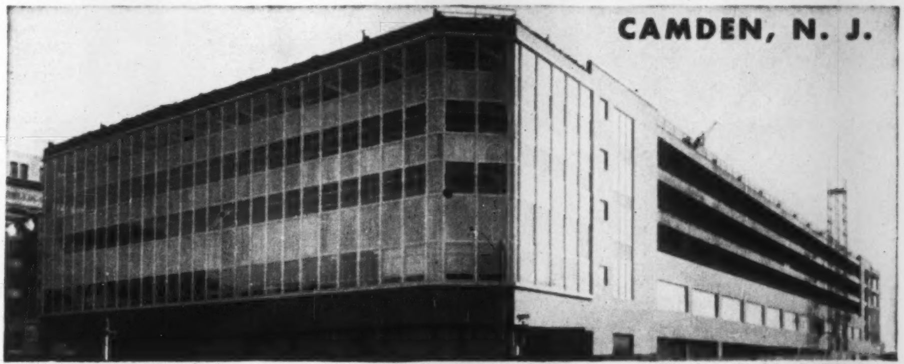
Cofar units are welded to the main structural framing members. At once, they make a working deck for all trades. Prior to concreting, negative steel is set over structural framing members for continuity. On Cofar spans over seven feet, one or two rows of temporary supports are needed. After concrete is placed, a fire-resistant, high-strength reinforced concrete floor results.

COMPARISON OF CONVENTIONAL AND COFAR SLABS


Positive and Temperature Bars Replaced with COFAR Construction
NEGATIVE REINFORCING (TRUSS BARS)
TEMPERATURE REINFORCING
POSITIVE REINFORCING
WOOD FORMS
Forms Eliminated with COFAR Construction
COFAR Slab Thickness Reduced Because of Less Dead Weight
NEGATIVE REINFORCING
CENTROID of COFAR
T-WIRE (Temperature Reinforcing)
Concrete below Reinforcing Eliminated
COFAR (positive reinforcing and form)

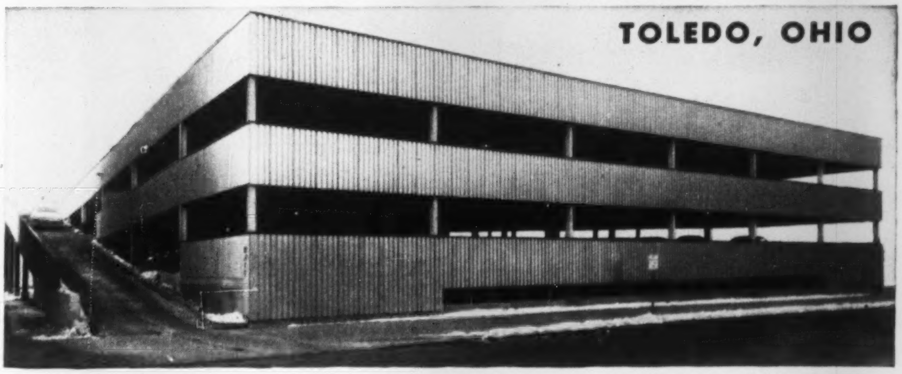
CONVENTIONAL SLAB

COFAR SLAB



326,000 Sq. Ft. of Cofar on 6′ 6″ spans were used on the Parkade, Camden's new parking deck and office building.

Architects & Engineers: *Ziegler, Childs & Paulsen.*
Consulting Engineer: *Lars I. Moe & Sons.* Builder: *Terminal Construction Corp.*



62,000 Sq. Ft. of Cofar on 9′ 0″ spans forms and reinforces the 3½″ concrete slabs of the four floors of Toledo's new City Hall Realty Parking Deck.

Architects: *Samborn, Steketee and Associates, J. H. V. Evans.*
Contractor: *Geo. W. Lathrop & Sons, Inc.*

parking decks pay off sooner

On-the-job photos show Cofar advantages

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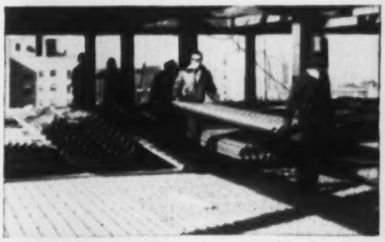

Immediate working deck. Cofar forms a solid, safe, sheltered working deck for all trades.

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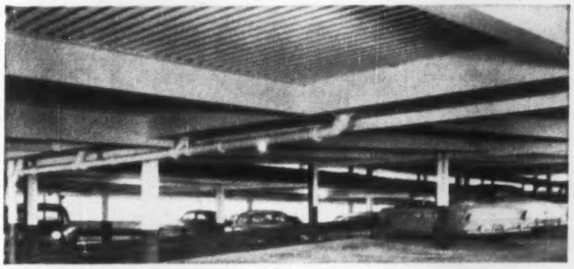

Attractive ceiling. In parking decks, exposed Cofar may be painted for a finished ceiling.

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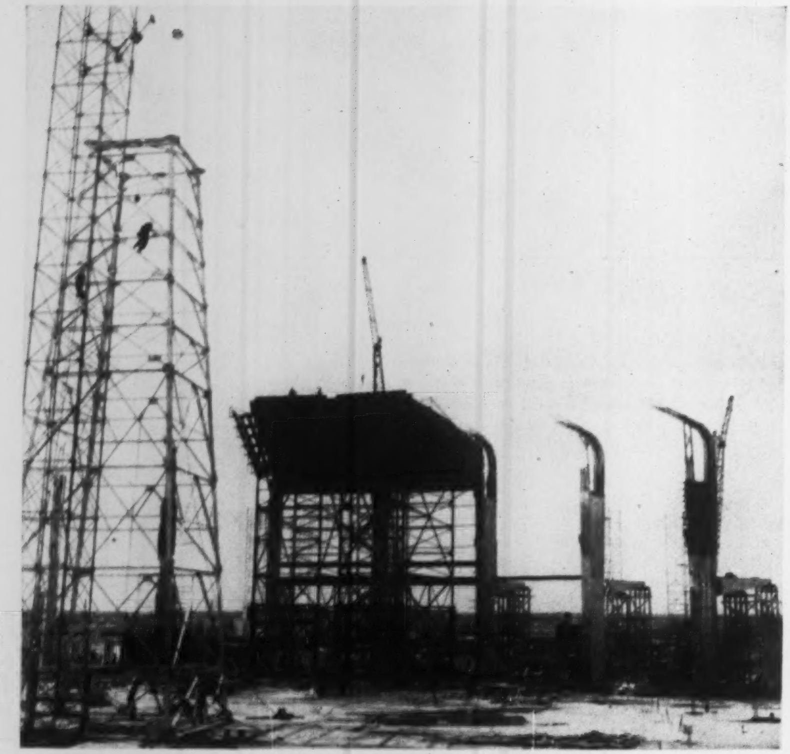

ROOF of Dallas Memorial Auditorium is being built on sections of movable falsework that roll in a circle around a central fixed falsework tower that supports the crown.

Dome Cost Halved by Design Permitting Movable Falsework

By keeping construction methods in mind when planning the concrete dome to cover the 300-ft-dia arena of the new municipal Memorial Auditorium in Dallas, Tex., the designers came up with a scheme which not only produced some remarkable economies, but also introduced some novel ideas into long-span dome building. The basic concept was to divide the roof into 16 separated, triangular or pie-slice shaped elements butting against a central circular plate so that each pair of opposing elements would constitute a self-supporting arch. Thus, only enough falsework to support one such pair of elements would be required, and the falsework could be made in the form of movable travelers.

To reduce the area to be supported by each piece of falsework each triangular element was divided into two parts, a cantilever arm at the outside and an arch between the cantilever and the central plate. The resulting roof, therefore, consists of a 204-ft dia dome carried on the ends of 48 ft arms, which cantilever from 70 ft high columns. There are 32 of these columns and cantilevers (since there is one at the center as well as at each edge of each of the 16 elements), and there are thus 32 radial ribs in the dome. Between these ribs the roof slab is 3 to 4 in. thick in the dome area and 4 to 6 in. thick in the cantilever area.

The designer, Ammann & Whitney, consulting engineers, New York, state that the use of this articulated framing arrangement did not materially increase the amount of concrete and reinforcing steel over that required for a full dome, while the savings in falsework and form cost resulted in total costs of about half those estimated for either a full concrete dome or a structural steel framed dome. The fact that there are no members of complicated shape is also held to be a contributing factor to the low bids received. The balconies, too, are to be built to a flat plate design, which will permit a movable falsework system here, and thus afford further economies.

The supporting columns, while large (2.5 x 7 ft), and heavily reinforced (sixty No. 11 deformed bars), would have been more massive, but for the balancing of loads and moments achieved in the design. By resting the dome on the ends of the cantilevers, the thrust on the columns was reduced while the resulting moment from the thrust was balanced by the vertical loads on the ends of the cantilever, which were increased by hanging steel framing for the press and mechanical rooms from the cantilevers. The columns are supported on reinforced concrete caissons of the drilled-in type. Although ranging in size up to 36 in. in dia, the caissons were easily constructed, some on a batter, through the sandy soil of the site. They were seated into underlying rock.

The falsework system for the roof adopted by the contractor, R. P. Farnsworth & Co., Inc., New Orleans, is shown in the accompanying drawing. It consistsof a central fixed tower and four movable falsework travelers, two at either side. The outside travelers take care of the cantilevers while the inside ones support the forms for the arch of the dome.

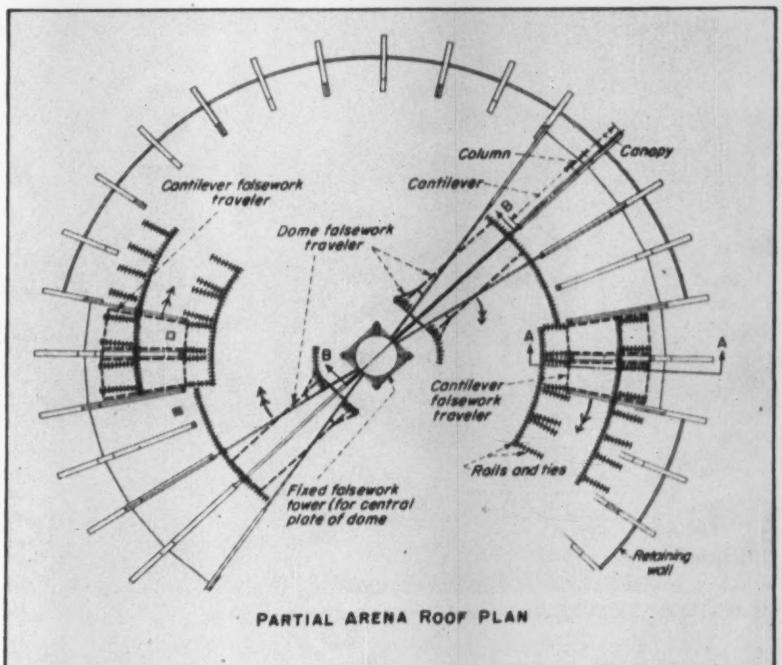
With this falsework system, a strip of roof across the diameter, encompassing one of the pie-slice-shape roof elements either side of the center, can be placed. In practice, since the cantilever bent portion will be self supporting and the central plate will be carried by the fixed tower, these parts of the roof can be concreted independently of others. However, when the intervening parts for the dome are placed, areas directly opposite must be concreted at the same time, so that when the falsework is removed a self-supporting arch element will be provided.

The first cantilever bents were concreted toward the last of February, while the central tower was being erected and before the dome falsework traveler had been assembled. With the central tower up, forms for the 22-ft dia center plate were set atop it on four sand jacks (for later de-centering) and this part of the dome concreted complete. A material hoist tower was used to lift the concrete to this level. It can also be used later to supply concrete for the dome forms or this can be raised in buckets by the crawler cranes with 100-ft booms and 30-ft jibs, which are being used to concrete the cantilever portions. In either case the concrete will be buggied from the receiving point to the forms. Concrete is supplied by a central mixing plant on the site and trucked to the building.

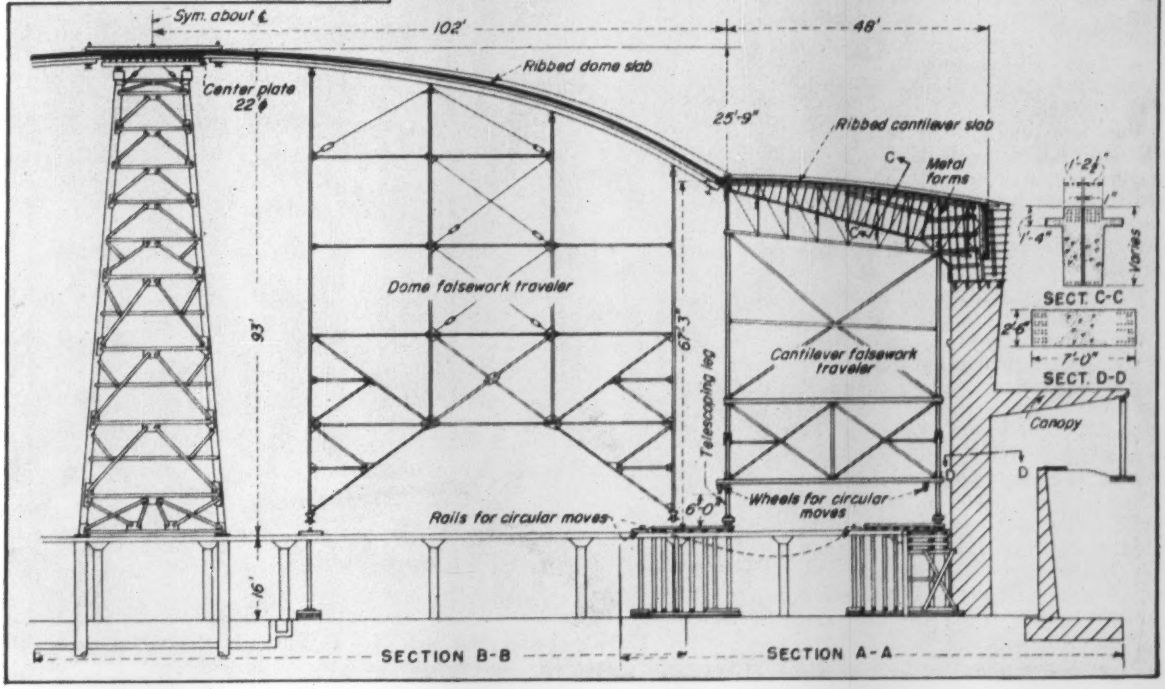
The movable falsework and forms for the cantilever and dome portions were designed and built for the contractor by the Dixie Form and Steel Co., formerly Records & Stephens Co., San Antonio. Since they must carry a considerable load of concrete the falsework units are relatively heavy steel structures, and those for the cantilevers have to be adjustable vertically. Each unit of dome falsework weighs 100,000 lb, while that for the cantilevers weighs 132,000 lb.

Structurally, each dome falsework traveler is a single structure, while two are required for each cantilever unit because of the center column and rib in this element. Once in a position, however, these two falsework travelers under the cantilevers are firmly joined together by steel members to form a single unit. The legs of this unit are equipped with telescoping sections at the base actuated by a hydraulic system which provides an 8-ft adjustment for raising and lowering the forms. On the dome falsework this vertical adjustment is accomplished by shims at the floor elevation to relieve the traveler wheels of the concrete load, and by screw jacks at the top directly under the forms for making final camber adjustments and striking falsework.

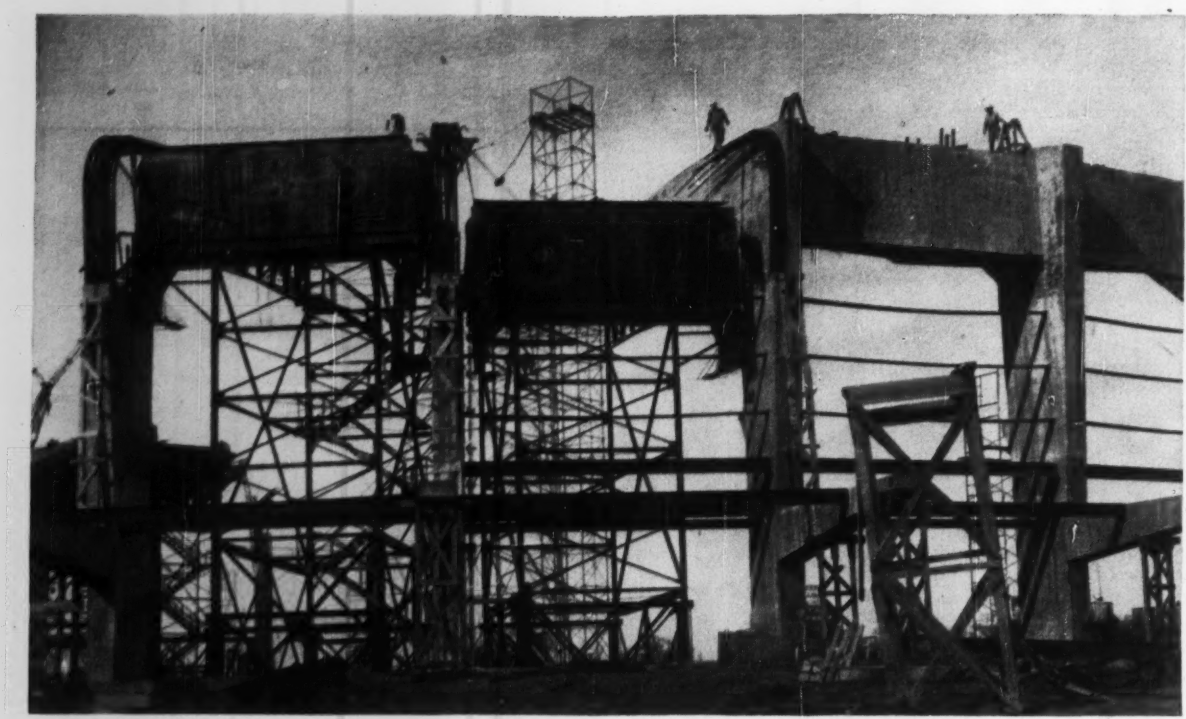
The falsework units are equipped with flanged wheels so that they can be moved around the arena on circumferential tracks laid on the first floor, which is locally shored up with heavy


Column
Canopy
Cantilever falsework traveler
Cantilever
Dome falsework traveler
B
A
A
B
Cantilever falsework traveler
Rails and ties
Fixed falsework tower (for central plate of dome
Retaining wall

PARTIAL ARENA ROOF PLAN


Sym. about ℄
102'
48'
Ribbed dome slab
Center plate 22'⌀
25'-9"
Ribbed cantilever slab
C
Metal forms
C
1'-2½"
1"
1'-4"
Varies
SECT. C-C
2'-6"
7'-0"
SECT. D-D
Dome falsework traveler
93'
67'-3"
Telescoping leg
Cantilever falsework traveler
Canopy
D
6'-0"
Wheels for circular moves
Rails for circular moves
16'
SECTION B-B
SECTION A-A

CONCRETING SCHEME for auditorium roof is based on use of pairs of falsework travelers that are moved in opposite directions around the arena on circumferential tracks. The cantilever travelers move ahead of the dome travelers, the latter being moved when two pie-slice-shape areas of roof opposite one another are complete and thus self-supporting as an arch.

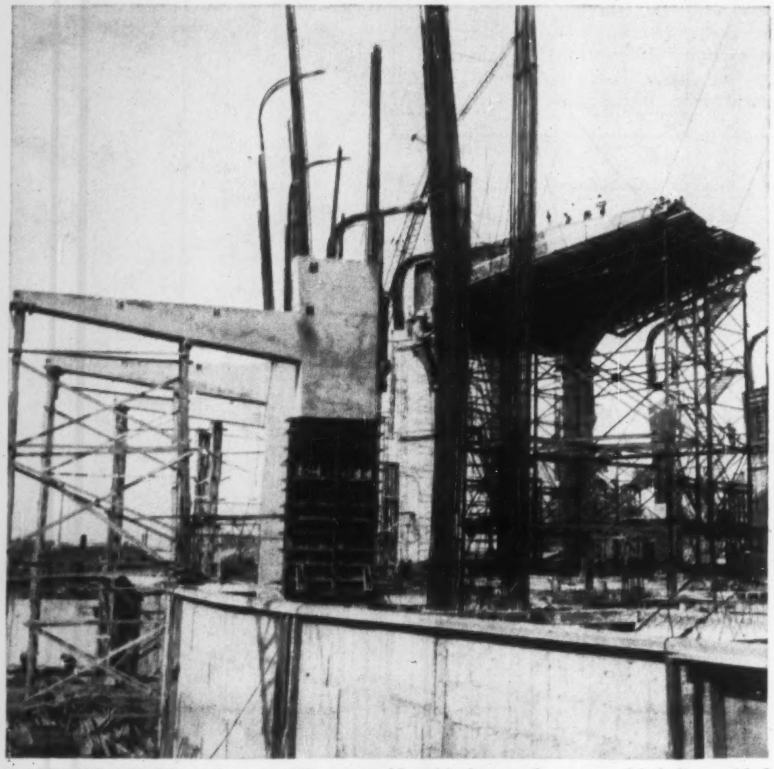


FALSEWORK TRAVELER for cantilever portion of roof being placed. Half at left is positioned, half at right is being raised.

. . . Dome cost halved

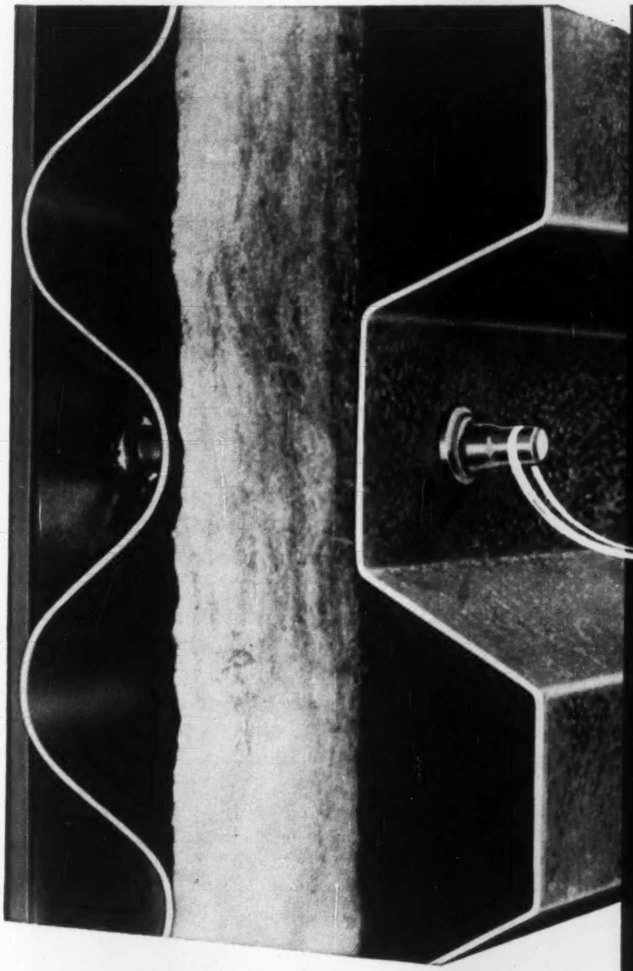
timbers from the basement floor. Only one set of these flanged wheels, faced in longitudinal direction, is used on the dome falsework, since it is always positioned over its circumferential tracks. For the cantilever falsework, however, which only moves on its circumferential tracks and must be translated outward on radial tracks to be in the concreting position, two sets of wheels approximately at right-angles to one another, are required. In all cases the falsework is raised off its wheels onto blocking when it is carrying concrete to increase stability of the traveler and to spread the large loads.

For the cantilever units, these loads are 72,000 lb on the back legs and 55,000 lb on the front legs, occasioned by the extra amount of concrete in the cantilever arms over that required in the roof shell alone. For this same reason of heavy load, and because the span of the cantilever falsework, front to back, is about 40 ft, a truss is used to support the deck of the forms, which consists of a $\frac{3}{16}$-in. plate stiffened with channel purlins. Because the deck forms on the dome falsework have to span only about 20 ft between supports a truss is not required, and an I beam suffices.



COLUMN STEEL is heavy. The sixty No. 11 bars, when assembled by welded spacers, weigh seven tons. Cantilever falsework traveler in background.

Architect for the Dallas Memorial Auditorium, which includes a large theater and numerous meeting rooms besides the circular arena, is George L. Dahl, of Dallas. Boyd Anderson, associate partner of Ammann & Whitney, is handling the job for that firm. For the contractor, H. P. Farnsworth, Jr. is director of field construction, P. W. Vortisch is superintendent and Joseph Sullivan office engineer.



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NOTE: Other reference data on this low cost curtain wall are published by Aluminum Company of America, Reynolds Metals Company, and Owens-Corning Fiberglas Corporation.

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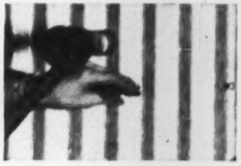
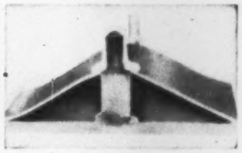


Interior corrugated sheet, Fiberglas insulation, and finally exterior ribbed sheeting are impaled over studs.

Hammer and simple tool are then used to affix the SETLOK cap and secure the entire sandwich. The cap can be removed if desired.



Cutaway section shows how SETLOK cap makes weather-tight seal. When cap is driven onto stud, serrations firmly grip the aluminum.

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Integration of design among a group of decentralized classroom units was the objective here. It was economically accomplished with the help of PYROFILL incombustible gypsum, especially adaptable to the continuous, unifying roof design. PYROFILL was poured in place at low cost over permanent formboards with valuable insulating properties. PYROFILL also offers these other advantages:

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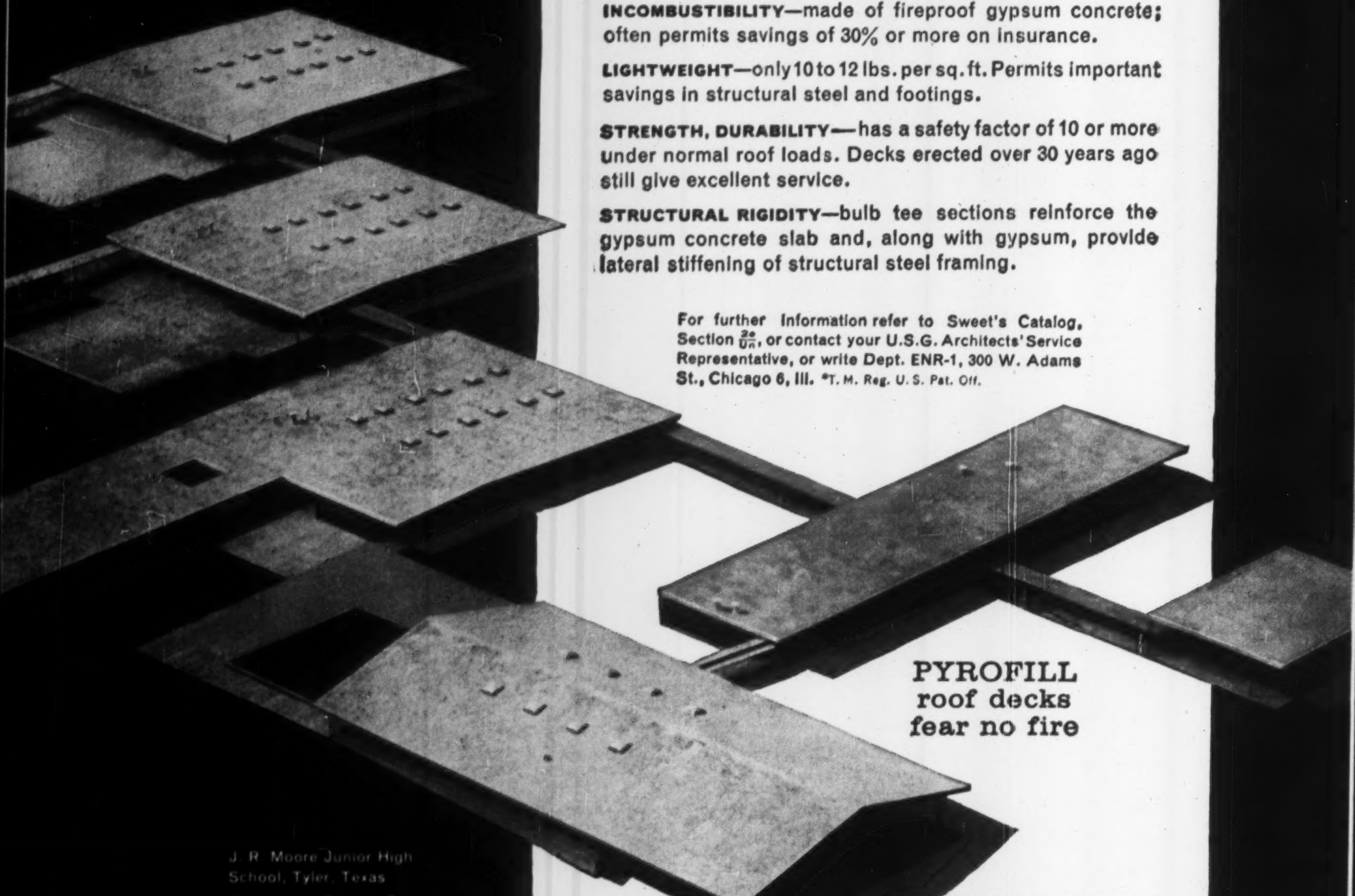
STRUCTURAL RIGIDITY—bulb tee sections reinforce the gypsum concrete slab and, along with gypsum, provide lateral stiffening of structural steel framing.

For further information refer to Sweet's Catalog, Section $\frac{2e}{Un}$, or contact your U.S.G. Architects' Service Representative, or write Dept. ENR-1, 300 W. Adams St., Chicago 6, Ill. *T. M. Reg. U. S. Pat. Off.



PYROFILL roof decks fear no fire

J. R. Moore Junior High School, Tyler, Texas

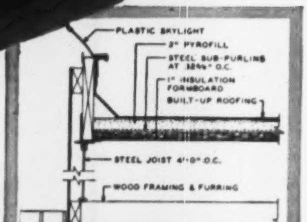
Architects—Caudill, Rowlett & Scott, Bryan, Texas

Associate Architects—Bruce & Russell, Tyler, Texas

General Contractor—Clanahan Construction Co., Tyler, Texas

Roof Deck Contractor—Macatee, Inc., Dallas, Texas

UNITED STATES GYPSUM



UNITED STATES GYPSUM

the greatest name in building

Florida tollway construction, figured at $74 million will wind up on schedule—with a $16-million surplus

Turnpike costs run . . .

21% Below the Estimate

C. E. Wright
Staff Correspondent
Jacksonville, Fla.

The initial 108.8-mi, "bob-tail" section of the Sunshine State Parkway—Florida's toll turnpike—now being built from Miami to Fort Pierce, may turn out to be the most economically built major tollroad in the U. S. Favorable climate and low acquisition costs take a big slice of the credit, but there are other factors.

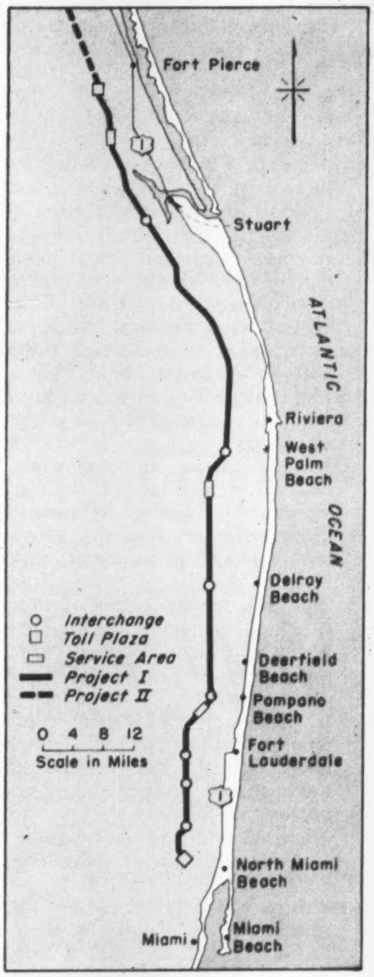
Thomas B. Manuel, chairman, and Sam P. Turnbull, chief engineer of the Florida State Turnpike Authority, point to a project cost about $16 million ($12 million on contract bids alone) below engineers' preliminary estimates. Part of the savings is based upon bids received for highway construction by the Florida State Road Department. Total cost, according to Manuel, will be less than $58 million —instead of $74 million as originally estimated.

The Miami-Fort Pierce section (Project I) will be built at a total cost of about $470,000 per mi, as compared with other turnpikes that have ranged in cost from a bit above this figure to several million dollars per mile.

According to Turnbull, contract savings have come about in several ways. But most prominent reasons are small unit contracts, climate, route location through low population-density areas, innovations in testing, and use of prestressed structures.

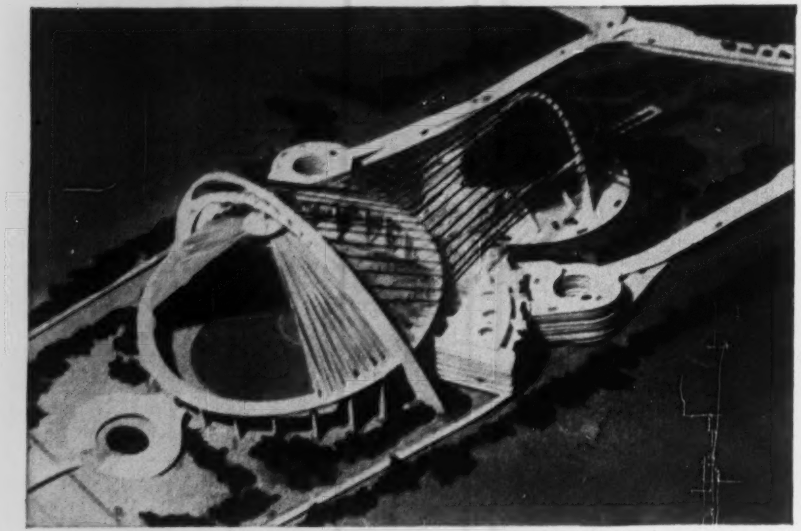
Contracts for grading, drainage and fencing were broken down into units covering from six to ten miles, so that small contractors could bid on the work. Under this system there was a minimum of subcontracting.

Florida's climate proves ideal for road construction. In the North, many contractors use their equipment only seven to nine months of the year; in Florida it can be used the year around. Florida has heavy rains, but


Fort Pierce
Stuart
ATLANTIC
OCEAN
Riviera
West Palm Beach
Delray Beach
Deerfield Beach
Pompano Beach
Fort Lauderdale
North Miami Beach
Miami Beach
Miami
1
1
○ Interchange
□ Toll Plaza
▭ Service Area
Project I
Project II
0 4 8 12
Scale in Miles

LOW-COST LAND provides the route, close-at-hand limestone forms base course, for the 109-mi Florida turnpike, studded with cost-saving prestressed bridges.

MARS outstanding design **SERIES**

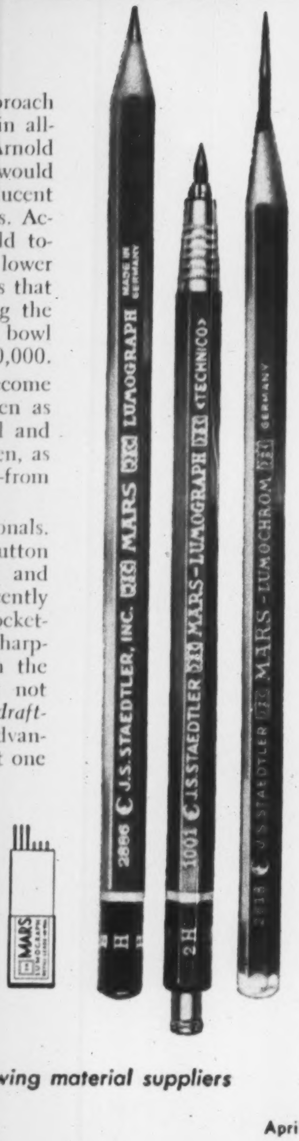


umbrella'd stadia

While it isn't always true, an interesting approach often results in a good design, as in these twin all-weather stadia designed by Harry Barone and Arnold Horn, Pratt architecture students. Each bowl would be umbrella'd by its own tentlike roof of translucent plastic, hung from the center of soaring arches. Accordion-pleated, these roofs are planned to fold together out of the way in fair weather, their lower edges riding along the rims of the bowls. Cables that guy the arches form a decorative pattern tying the two stadia together. The big football-baseball bowl would hold 65,000 spectators; the smaller, 20,000.

No matter which of today's bright ideas become tomorrow's reality, it will be as important then as it is now to use the best of tools when pencil and paper translate a dream into a project. And then, as now, there will be no finer tool than Mars—from sketch to working drawing.

Mars has long been the standard of professionals. To the famous line of Mars-Technico push-button holders and leads, Mars-Lumograph pencils, and Tradition-Aquarell painting pencils, have recently been added these new products: the Mars Pocket-Technico for field use; the efficient Mars lead sharpener and "Draftsman's" Pencil Sharpener with the adjustable point-length feature; and—last but not least—the Mars-Lumochrom, the new colored *drafting* pencil which offers revolutionary drafting advantages. The fact that it blueprints perfectly is just one of its many important features.



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2H
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The 2886 Mars-Lumograph drawing pencil, 19 degrees, EXEXB to 9H. The 1001 Mars-Technico push-button lead holder. 1904 Mars-Lumograph imported leads, 18 degrees, EXB to 9H. Mars-Lumochrom colored *drafting* pencil, 24 colors.

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at all good engineering and drawing material suppliers

even these have not slowed work materially. In fact, the rains have helped in compaction of sandy soils.

• Short hauls, long dividends—Materials for Florida highway construction usually do not involve long-distance hauling. This, particularly, is the case on the Florida turnpike. One of the requirements was about 14,000,000 cu yd of excavated fill, of which more than 9,000,000 cu yd were obtained in the digging of canals and ditches alongside the turnpike. The rest came from borrowpits not far from the right-of-way.

As soon as the route had been definitely established, there were complaints from farmers in the rich winter vegetable and beef raising area through which the toll road runs. The course of the turnpike is partly along a north-south canal which provides many farms with irrigation water, and farmers feared that this source of water would be cut off. Manuel assured them that the authority would see to it that they had adequate supplies. In fact, excavation operations were utilized not only to enlarge the present canal on the east side of the route, but to build another canal on the west side, with necessary laterals to connect both canals, thus assuring a greater supply to both sides.

Draglines scooped soil from the old and new canals and placed it on the right-of-way. Mostly sand and other poorly cemented materials, the earthfill got three mixings, which helped in subsequent stabilization and compaction. Various soil types were mixed when they were dumped on the roadway, then mixed again as piles were picked up and moved to other areas. A third mixing occurred when the materials were spread on the roadway. Simplicity of grading operations was taken into consideration by contractors bidding for work, resulting in lower prices.

In the second phase of the construction program, contracts for roadbed and limerock base again were broken into small segments. Contracts covered lengths of 10 to 14 miles. In the awards of bridge contracts, no one contract covered more than five bridges. In the 108.8-mi section there are 86 bridges ond overpasses because of numerous rivers, canals, side-road and rail crossings in the area. In one 20-mi stretch alone, the Delray Beach section, there are 41 canals. The St. Lucie Canal bridge near Stuart, the largest on the entire turnpike length, is 3,000 ft long, not too big for one contractor, but still its construction was split three ways. One contract was for substructure, another for superstructure, and the third for handrail and decking.

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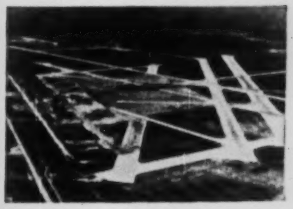

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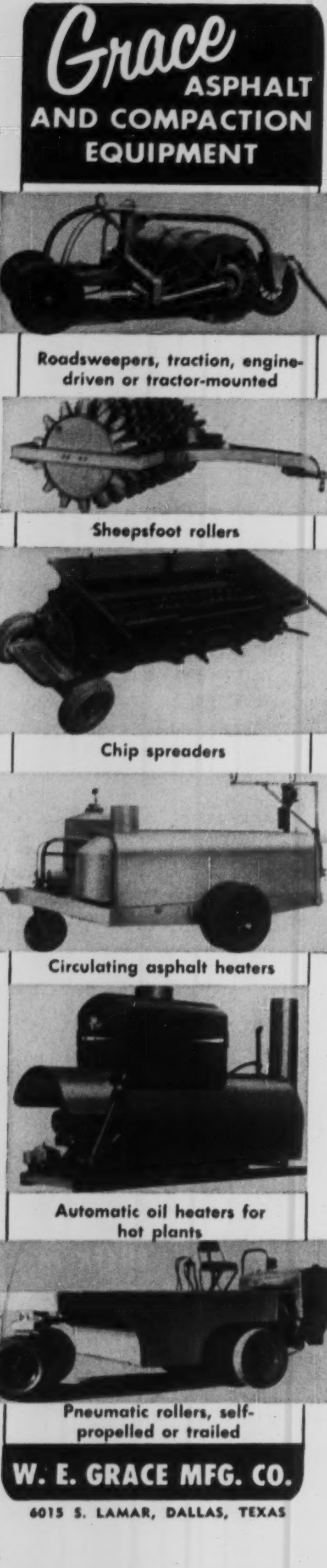
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TESTING CONSTRUCTION QUALITY—as well as samples of soils, concrete and limerock base material—is a continuous operation with agency-owned equipment.

The last and final bids—surfacing contracts—were received March 15. This work was broken into eight segments ranging from 10 to 21 miles in length. Longer stretches for paving than for grading and roadbed were practical because surfacing is a much faster operation. It was specified, however, that successful bidders provide adequate plants and stockpiles of materials (or rail sidings) capable of maintaining delivery rates of 100 tons per hour so that surfacing operations could be carried on at a minimum rate of one mile a week. Four miles per week was the planned goal.

• Continuous testing is vital—Turnbull states that "another sizable portion of the savings is being contributed daily through the operation of our testing laboratory, which is probably the most complete laboratory of its type owned and operated by any turnpike agency in the country." The turnpike lab was set up with the assistance of H. C. Weathers, engineer of tests and materials at the State Road Department Laboratory at Gainesville.

The turnpike lab, under the direction of Testing Engineer Jack R. Swaine, will result in direct savings, according to Turnbull, of $250,000 on the section under construction alone. It is expected that larger savings will be effected in the much longer turnpike extension (Project II) to be built northward to a point above Jacksonville. The laboratory renders fast service to contractors and thus is credited with shortening the time required to build the highway. It is situated in a separate building adjacent to the turnpike headquarters near Fort Lauderdale.

• Equipped for sample variety—From 45 to 60 concrete test cylinders, 40 and 60 soil samples and 15 to 20 limerock samples are tested every day as part of the routine checking. Florida soil is tricky and variable, mostly sandy and with very little clay except in some northern parts of the state. A special machine to determine bearing capacity of soils—designed by the state road department—is in constant use. In the process, dried soil samples are placed in metal cups, moisture is added to bring it up to normal content and the soil is then compacted under a pressure of 1,200 lb. A metal disc with a surface area of one sq in. is placed on top of the cupful of compacted soil and pressure is applied until the soil ruptures, thus establishing its bearing capacity.

In order to determine the maximum density for a particular soil, the Modified Proctor soil testing machine is used. If it is found that a particular soil is greatly deficient in cementing qualities, a sludge by-product of local crushed aggregate (calcium-magnesium carbonate) is added. In northern sections of the state, it will be possible to obtain marls, hardpans and clays from borrowpits for this use.

Because of some road failures in Florida, caused by an insufficiently heavy subbase, specifications for the turnpike were made unusually rigid. The subbase consists of 12 in. of compacted soil with 75 psi bearing capacity, then 8 in. of limerock. The surface is 2½-in. asphalt consisting of a 1½-in. binder course and 1 in. of topping—all hot mix. The design provides for 20,000 lb axle loads at speeds up to 70 mph except at terminal points. Although this is as heavy a roadway as has been built on any turnpike, according to en-

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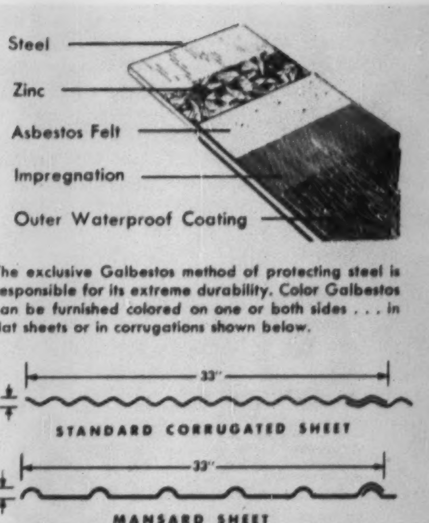

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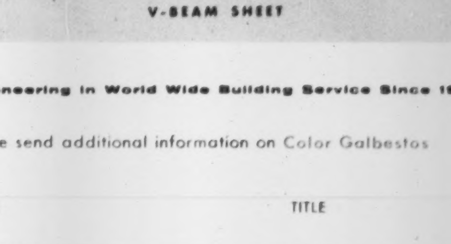

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The popularity of this equipment has grown by leaps and bounds as one contractor after another discovered that with it specified densities can be achieved with greater uniformity, more economically and in less than one-half the time required with equipment of other types. Moreover, the Jackson Multiple will get into places larger equipment cannot reach, and for the really tight spots, individual compacting units may be detached, fitted with operating handles and operated like a standard, self-propelled manually guided compactor.

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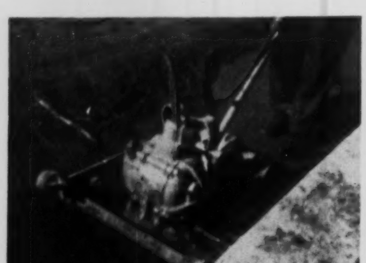
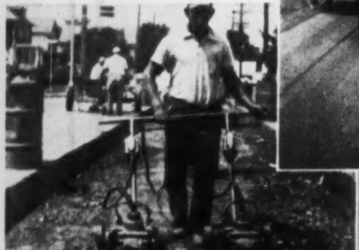
Jackson manually-guided, self-propelled vibratory compactors deliver 4200 2-TON blows per minute. Achieve specified density of granular soils in layers as thick as 10" at the rate of 1800 sq. ft. per hr.



One man can readily operate a twin hook-up of Jackson Compactors, thereby virtually doubling production. Current is usually supplied by power plant on auto trailer (single or twin unit) with hydraulic pick-up of Compactor.



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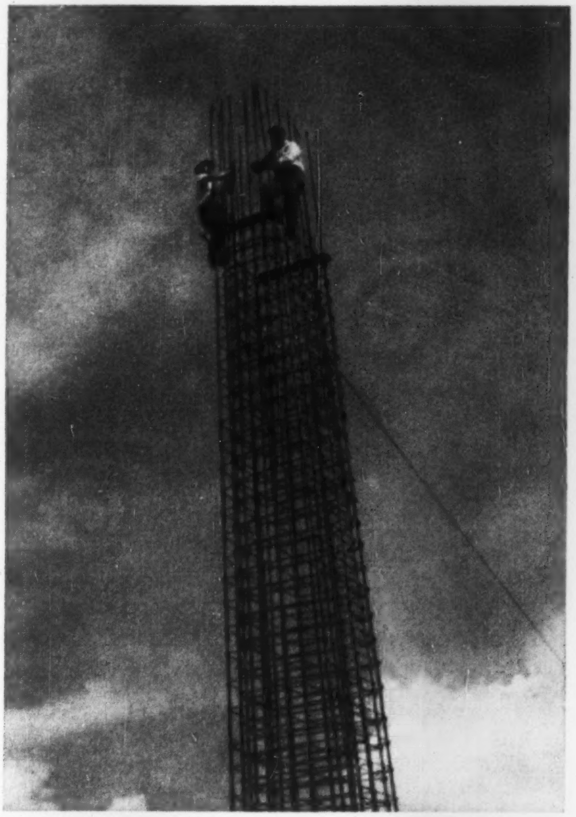
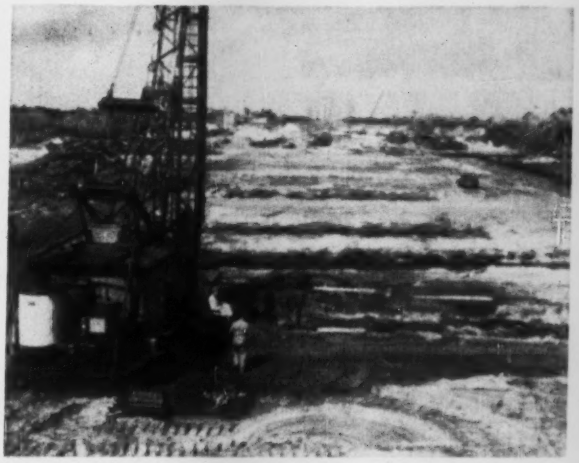


Ironworkers Turn Steeplejacks, in assembling reinforcing cages for the columns of the St. Lucie Canal bridge.



Driving Piles for the St. Lucie Canal crossing, largest bridge on the turnpike whose superstructure will consist of prestressed concrete beams fabricated at conventional locations along the route.

gineers, it has been less costly in Florida, owing partly to the large use of local materials.

A high degree of mechanization has accomplished two things. It has enabled contractors who put in low bids to come out with a profit and has speeded up work so that some jobs are ahead of schedule. All apparently will be completed on schedule—Jan. 1, 1957. With the letting of paving work in March, the total number of contracts was about 60. There aren't that many contractors—some are handling more than one job.

• **Acquisition costs low**—Another factor that has worked in favor of the contractors is that right-of-way selected for the turnpike is mostly through farm and ranch land, some of it undeveloped. This made acquisition costs lower, and gave contractors plenty of room in which to operate. They weren't hemmed in by buildings of densely populated areas that frequently raise costs on projects this size. Moreover, sand is easier to work with than the heavier boggy soils that become unmanageable in wet weather. Rains, therefore, proved an aid rather than a hindrance in keeping the fine sand moist and workable.

• **Prestressed bridges**—An interesting feature of the project is the large amount of prestressed concrete that is being used for bridge construction—more, in fact, than has ever been used in Florida or elsewhere, engineers say, on a highway of similar length. The Sunshine Skyway (ENR, Feb. 26, 1953, p. 36) over Tampa Bay, completed in Sept. 1954, was said to be at the time of its construction, the largest structure ever built of prestressed concrete. W. E. Dean, engineer of bridges of the state's road department and a leading advocate of prestressed concrete in bridge construction, furnished the design criteria for the Sunshine State Parkway bridges.

Of the 86 bridges on the turnpike, 28 are prestressed. R. H. Wright & Son, of Fort Lauderdale, is prestressing for all contractors in their yards at Dania and Deerfield, using the hydraulic jack method of pre-tensioning. The largest beams are 36-in. by 57 ft long. If longer beams are used on the northern portion of the turnpike, post tensioning will be used. The longest haul for the prestressed beams is 90 mi.

Some difficulty was encountered in driving piles to get the required 45 ton bearing value. In one spot, a pile might be smashed because of big boulders, some of them only a foot below grade, while a few feet away, the soil would have no bearing value whatever. Test borings revealed that hard bedrock might be found at depths of from 30 to 80 ft, varying as much as 20 ft in a structure foundation. A friction-type pile foundation was necessary in some cases.

• **Road design**—The turnpike consists of two 34-ft-wide pavements separated by a 20-ft median, with a 10-ft parking shoulder on the right side of each pavement. Service areas at 35-mi intervals are created by a spreading of the median to provide space for a restaurant, filling station and parking area, accessible to both north and south-bound travelers.

Right-of-way is 300 ft wide except in urban or congested areas, where the minimum is 200 ft. Grass planting was made part of the grading contract. Most of the grass planting was sublet, however, to Ammon McClellan of Okeechobee, Fla., who is a specialist in this line.

McClellan uses a flossing machine to spread fertilizer and seed, but since Florida grass is grown mostly from sprigs, he has adapted a mulch spreader to sow these. The authority has started its own nursery to grow cabbage palms and flowering shrubs, which will be set out along the route before it is opened to traffic.

Engineering supervision is provided

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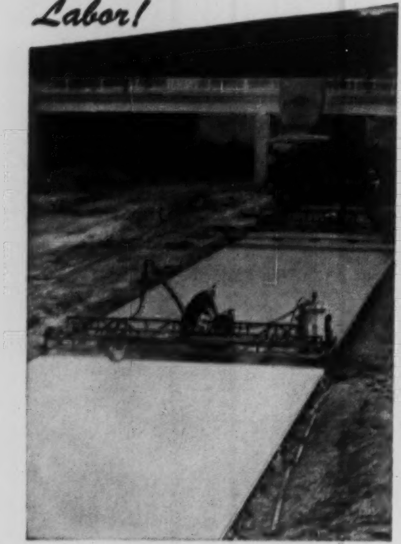

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EXCAVATED MATERIAL AT DRAGLINE DISTANCE—Almost two-thirds of all embankment fill was scooped from right-of-way, mixed and stabilized by rehandling.

on a sectional basis, all under supervision of the chief engineer and the consulting engineers, Howard, Needles, Tammen & Bergendoff. The firms handling the sections are listed in the accompanying table.

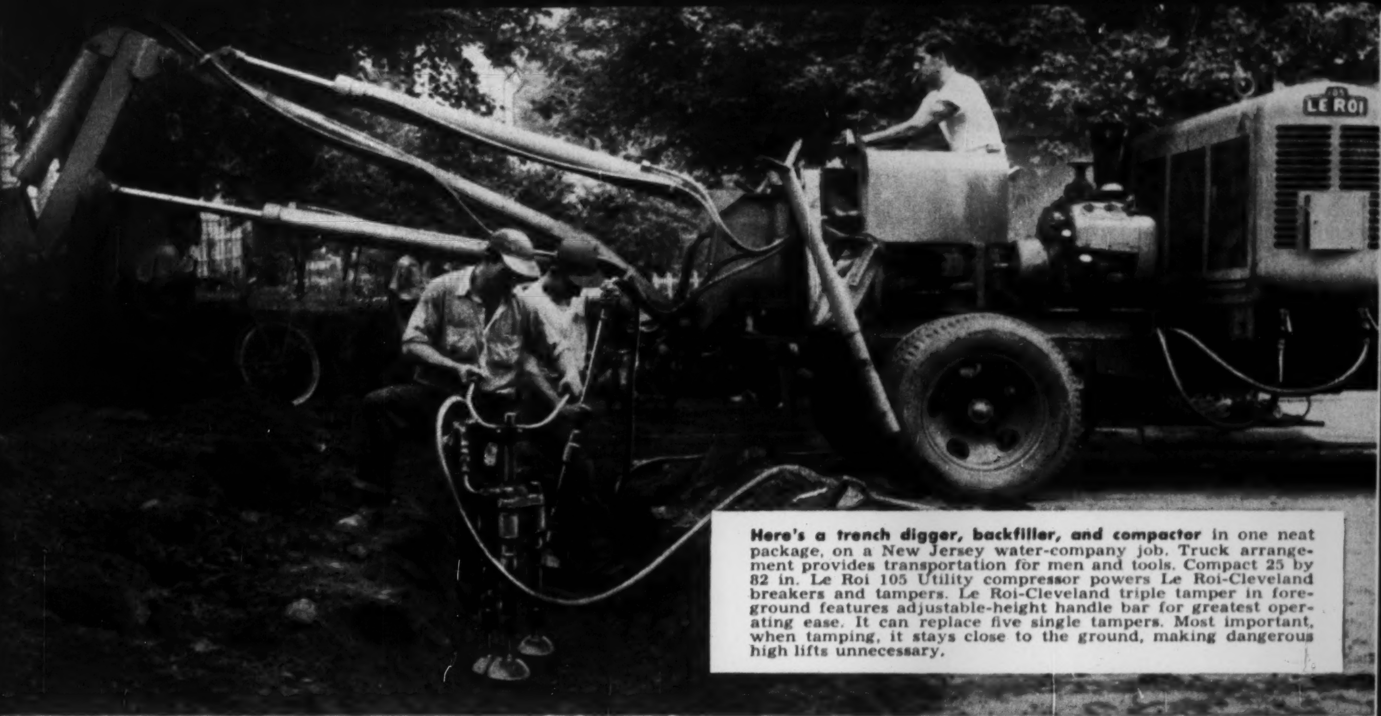
This method of supervision has, in the opinion of the turnpike managers, worked so successfully that it will be carried out in the northern extension of the turnpike, which will be divided into 21 sections (making 27 for the full route). The northern extension, running from Ft. Pierce to Tisonia, a point about 15 mi north of Jacksonville, is 279 mi long. When connected with the bob-tailed turnpike now under construction, Florida will have a 388-mi superhighway almost the full length of the state.

Present schedules provide that a bond issue of $185 million will be validated in the courts and sold in time for work to be started by midsummer. Following the methods of accelerating construction that have worked successfully on the bob-tailed section, the turnpike authority predicts that the state-long job can be completed by the fall of 1958, a full year ahead of the time originally planned. It is also believed that costs, based on current experience, will be less than originally estimated. Thus, the bond issue has been reduced to the present figure from the $200 million initially considered.

But there will be a net surplus of about $10 million on the bob-tailed section. This, coupled with a $6.5 million untouched contingency fund, will provide a net contingency reserve of at least $16 million. About $2 million of the net savings is being used to extend the southern terminus to Miami, about six miles south of the Hollywood terminus originally selected.

Section Office Breakdown

Firm	Section	Representative
Michael Baker, Jr., Inc., Dania, Fla.	Dania	John Grant
Maurice H. Connell & Assoc., Miami, Fla.	Miami	Edmund Friedman
	Pompano Beach	W. C. Bliss, Jr.
Gannett, Fleming, Corddry & Carpenter, Harrisburg, Pa.	Delray Beach	J. M. Kanter
Reynolds, Smith, Hills, Inc., Jacksonville	Riviera Beach	N. L. Bryan
Smith & Gillespie, Inc, Jacksonville, Fla.	Stuart	A. H. Burleigh
Bail, Horton & Assoc., Bradenton, Fla.	Ft. Pierce	W. E. Robinson
E. Lionel Pavlo, New York City	St. Lucie Bridge	



Here's a trench digger, backfiller, and compactor in one neat package, on a New Jersey water-company job. Truck arrangement provides transportation for men and tools. Compact 25 by 82 in. Le Roi 105 Utility compressor powers Le Roi-Cleveland breakers and tampers. Le Roi-Cleveland triple tamper in foreground features adjustable-height handle bar for greatest operating ease. It can replace five single tampers. Most important, when tamping, it stays close to the ground, making dangerous high lifts unnecessary.

Work-Saving Air-Tool Applications

by LE ROI

Highway construction in Mexico is frequently for the birds, or literally could be as this picture indicates. Two operators pictured on this treacherous perch rely on easy-handling Le Roi-Cleveland sinkers, as do 38 others on job. To complicate the fatigue problem, this area around Chilpancingo is often subject to extreme heat. Sealed dust-proof feature is one reason why these tools produce the powerful, constant rotation needed for fast drilling.

On this $1,600,000 Cleveland sewer job, Le Roi-Cleveland clay diggers set a daily 20-ft. pace. The C-10 clay spade was chosen because a great deal of handling and lifting were required. Operators appreciated a well-balanced tool for this rush job. The spade also is free from bumps, so that operators can get a firm grip and still work close to tunnel walls.

LE ROI
REFRIGERATIO

Gas company employee breaks through tough 12-in. concrete. To speed emergency repair work, this utility chose the maximum shattering impact of a Le Roi-Cleveland 52 paving breaker. Work speed, however, was only one consideration. Low-cost operation was important too. The 52's piston air-cushion reduces internal part wear, makes handling easier.

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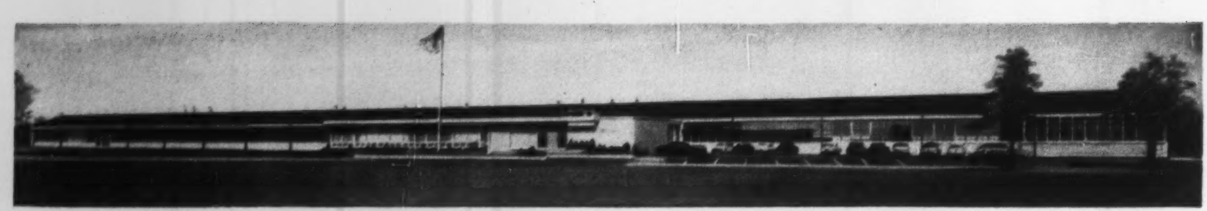

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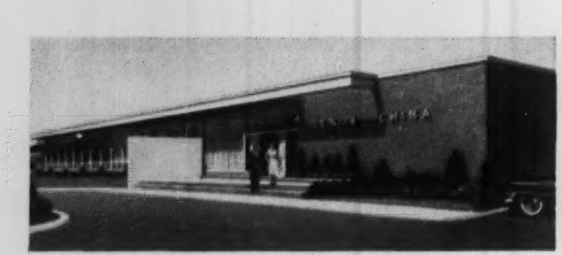

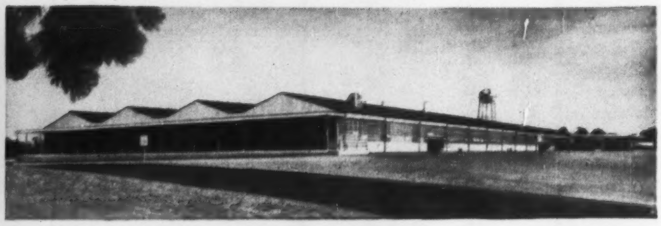

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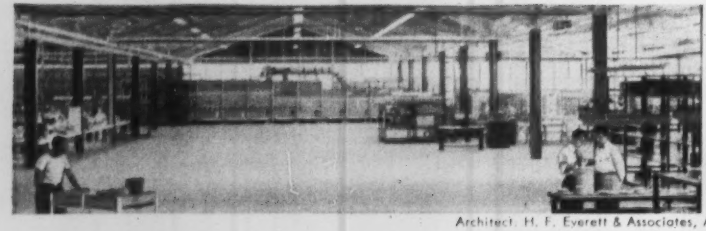

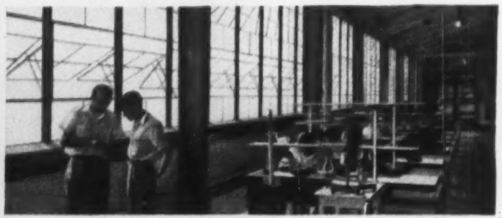

Architect: H. F. Everett & Associates, Allentown, Pa. General Contractor: Ole Hansen & Sons, Pleasantville, N. J.

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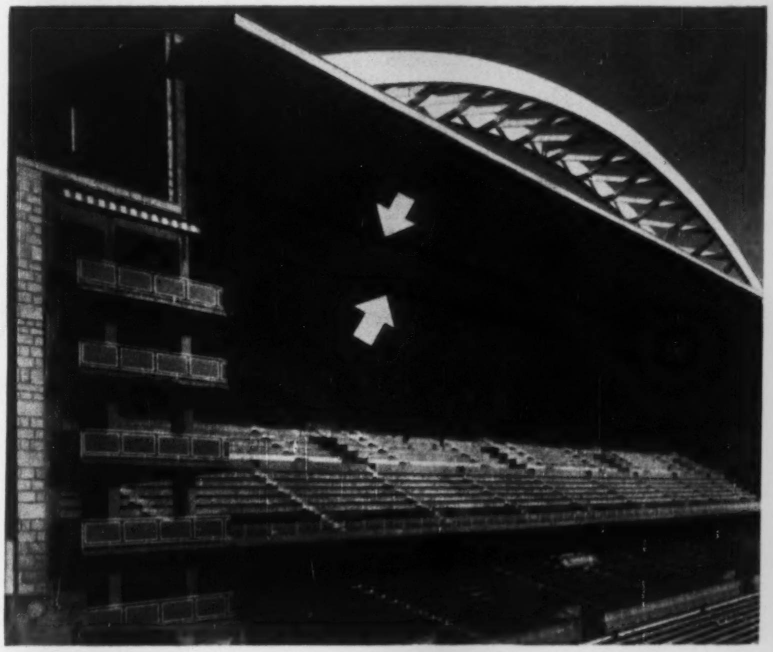


377-ft tied arches carry post-free roof at San Mames Stadium, Bilbao, Spain. Supported only by rear wall and overhead arches, roof deck covers the full grandstand width and 92-ft depth. Arch ties (arrows) cross grandstand below roof girders.

Grandstand Roof Hangs From Arches

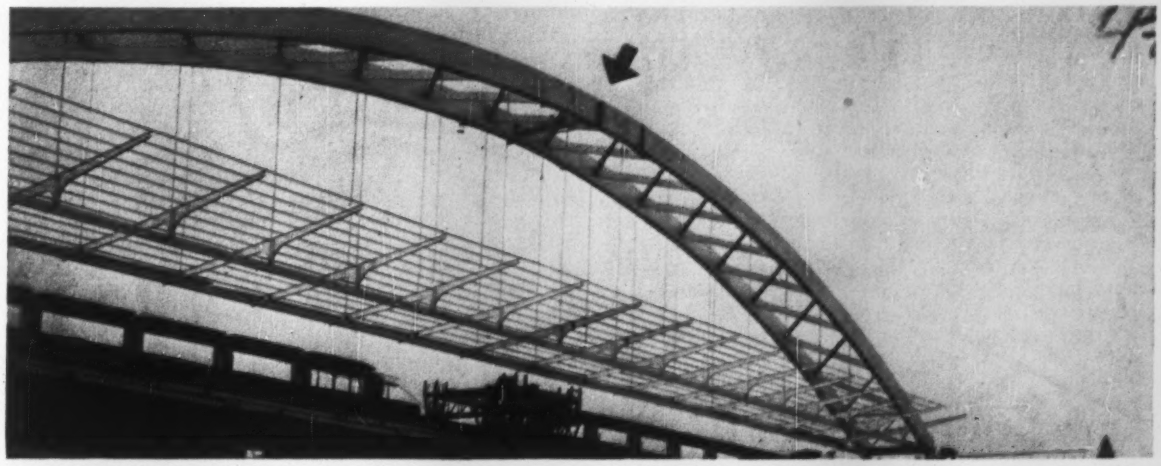
Bridge-like in silhouette, two 377-ft steel-tied arches rise 53 ft above the suspended roof deck of the grandstand at San Mames Stadium, Bilbao, Spain. At 20-ft intervals along the two-hinge span, hanger rods extend from the huge box-section ribs to pick up 92-ft roof girders below.

Supported only by the rear wall and the hanger rods, the girders frame a post-free 379x92-ft roof canopy above the upper tier of seats.

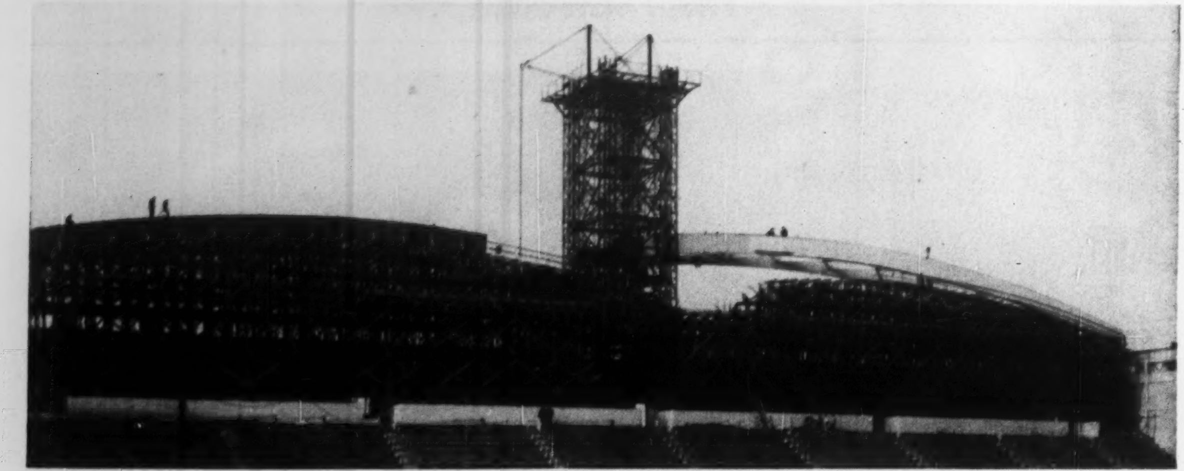
After the arch ribs, bracing, ties, hangers and half the roof framing (the rear 44 ft was welded in place later) had been raised and completely assembled, the most impressive operation of the job still remained to be done. The 250-ton welded structure had to be pulled 46 ft along the top of the stadium side walls to final working position.

The shift required two distinct operations, one at each end of the grandstand. Perfect control and timing of the two operations were vital because of the possibility of encountering unknown vibration and inertia forces and the danger of overturning. Four hand winches, picked as the best means of combining heavy handling with rapid response, completed the move in 17 hours.

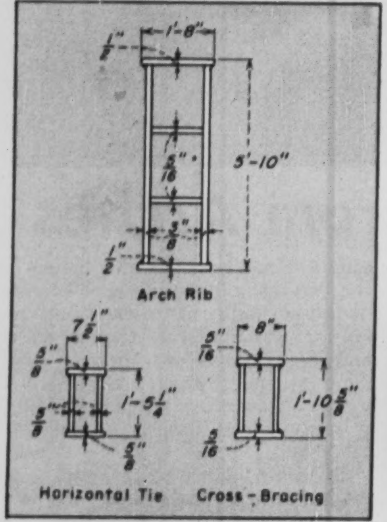
In earlier phases of the job, shop-fabricated lengths of arch ribs and bracing were hoisted to a centering



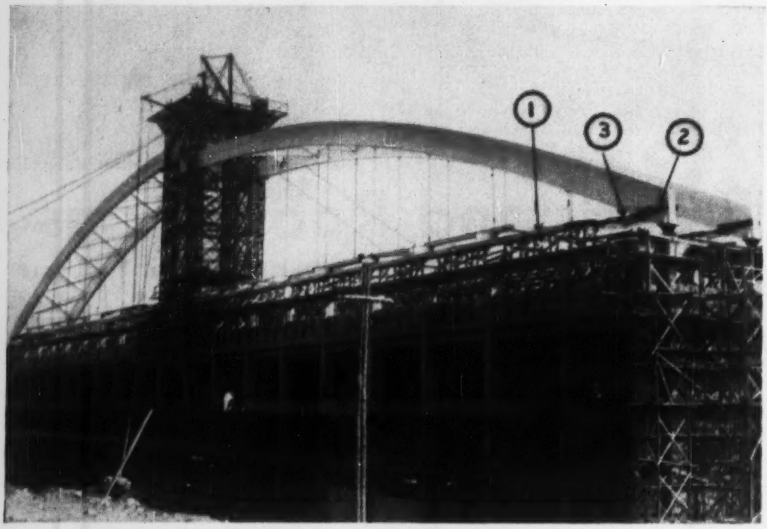
BRACED PAIR OF ARCHES, with roof framing suspended, was hand-winched from assembly position, 46 ft forward along top of grandstand walls. Middle hinge (arrow) was welded later to give arches 2-hinge action.



ARCH CENTERING carried ribs till they were assembled and braced. Tower at center tilted half-spans about base pins to final height. Because ribs overlapped in tower, segments on right were finished first, raised to make room for left pair.



STEEL BOX SECTIONS were shop-welded in short lengths, field-welded into final assemblies.



ROTATING ON BASE PINS, ribs near top of tower. Some tower braces had to be removed before each lift increment so ribs could pass between uprights. Arch tie (1) is attached to rib by temporary clevis (2). Tie stub (3) and tie were welded later.

framework inside the rear of the grandstand and welded into two half-span assemblies. Each assembly comprised two adjacent half-arches, 21 ft 8 in. c-c, and the intervening crossbracing.

At this stage, the crown ends of the assemblies lay within the framework of a central hoisting tower and about on a level with the springing. Base joints were pinned, in readiness for the next operation—elevation of the crown to final height, where the two ends would be temporarily hinge connected also.

Raising of the crown ends was accomplished in a series of short lifts. Before each lift, some of the tower bracing members had to be dismantled to allow the arches to pass upward between the uprights. Step-by-step raising was necessary also to allow shifting of the cable-to-arch attachment points. These points described arcs about the base hinges; consequently, each lift displaced the points horizontaly as well as vertically, thus introducing horizontal components into the cable loads. Shifting the attachment points at each level limited these components.

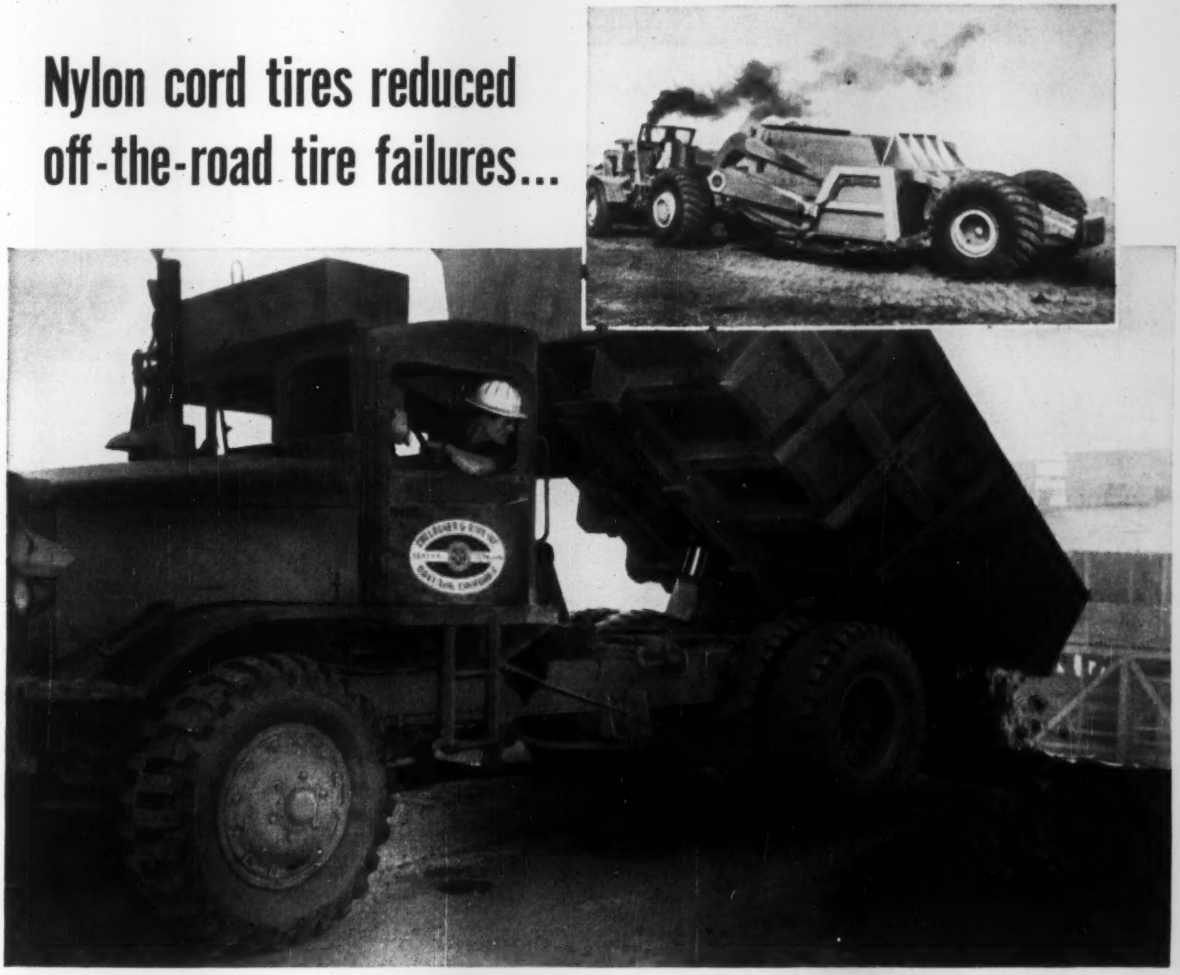
After the ties, roof framing and hanger rods were assembled and connected to the ribs, and the crown joint pinned, tower support was disengaged. It had to be withdrawn slowly so that the ribs could make a gradual transition from beam to arch action. Meanwhile, the horizontal ties were receiving load increments—longitudinally from the arch thrust and transversely from the hanger rods. To avoid unequal and excessive transverse loads on the ties during the transition, hanger stresses were measured with resistance extensometers and regulated by turnbuckle adjustments.

All-welded box-sections were used for arch ribs, ties and bracing: ribs are 20x70 in.; ties, $7\frac{1}{2}$x17 in.; bracing, 8x23 in. Suspender rods are $1\frac{9}{16}$-in. rounds.

C. Fernandez Casado, structural engineer, designed the project in collaboration with architects José A. Dominguez Salazar, Ricardo Magdalena and Carlos de Miguel.

(*International continued on page 64*)

Nylon cord tires reduced off-the-road tire failures...



NOW NYLON CUTS TRUCK TIRE COSTS, TOO

JOHN GALLAGHER, Gallagher & Burk, Inc., Oakland, California, reports:

"We tried our first nylon cord tires on heavy, off-the-road equipment, where tires have to be able to take it. When we saw how they cut down tire failures, we began switching our trucks to nylon cords, too.

"Since then we've had far fewer truck tire failures—less carcass damage and fewer impact breaks. What's more, nylon cord truck tires give us 33% more retreads, a big help in bringing down tire costs.

Plans an All-Nylon Fleet

"There's no doubt about it—we're sold on nylon cord tires. With 350 now in service, we specify nylon cord tires for all replacements and on all new equipment. Soon we expect to have a 100% nylon cord fleet."

PROVE TO YOURSELF that nylon cord truck tires give more mileage, more retreads—lowest cost per mile. Ask your dealer about nylon cord truck tires today. (Du Pont makes the tough nylon yarns, does not produce tires.)

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. . . THROUGH CHEMISTRY

NOW . . . IN PASSENGER-CAR TIRES, TOO . . . THE STRENGTH OF NYLON . . .
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NEW PROPANE
6000 C.P.
FLOODLIGHT

50-150 hours light on 20 lb. tank of Propane.

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Lights instantly with match in —45° temperatures.

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- **TESTED**—50 million installed over 30 years, U. L. & FM approved.
- **FIREPROOF**—Al-steel—no lead to melt or creep.
- **VERSATILE** — All sizes and types for every job. Not preset—install where and when needed.

Write for COST SAVING DETAILS
PHILLIPS DRILL CO.
Dept. 41, Michigan City, Indiana

Schedule Keeps Pace With Speed-Up—

Inter American Highway Miles Mount

The speeded-up program for completing the 3,179-mi Inter American Highway to the Panama Canal by 1958 is keeping pace with its schedule.

Taking stock of gains shows that the Central American section—running 1,573 mi from the Guatemalan-Mexican border to the Canal—now has 548 mi that are paved and 852 mi rated as all-weather. And, of course, the thousands of miles in Mexico leading from several points on the U. S. border to Guatemala already are in service.

But the Central American section still has 173 mi that remain impassable. Most of these roadblocks—some 134 mi—are concentrated in Costa Rica and lead from San Isidro to the Panama border. Other unopened spots involve a 25-mi Guatemalan stretch adjoining the Mexican border and a 14-mi Panama section running from the Costa Rica border to Conception.

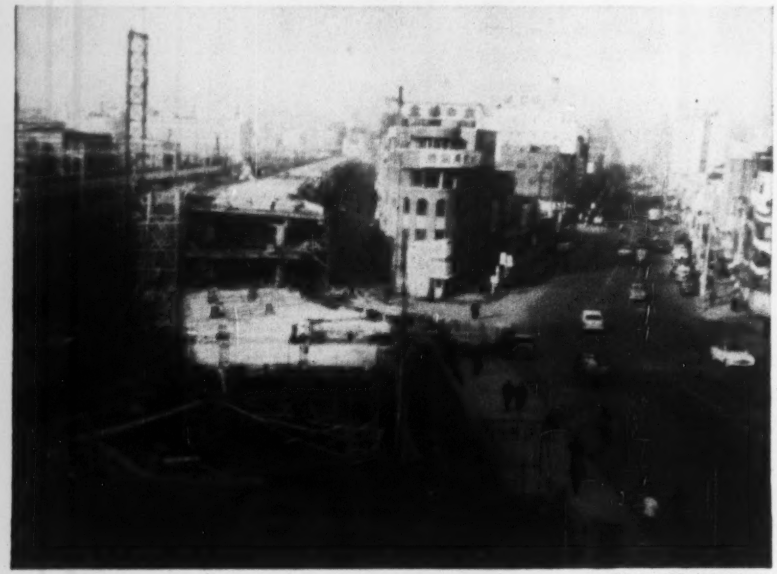
It will take $109.6 million to wind up construction on the Central American part of the highway. And in the fiscal year beginning last July 1 the U. S. Congress appropriated $62,980,000 for the project. This money is available under earlier legislation authorizing a total of $74,980,000 as the U. S. two-thirds share for completing the work. The other third of the cost will be provided by the countries themselves.

These are the latest developments in the highway program as reported by the International Road Federation:

Guatemala—All of the 175-mi northern part of the highway—running from Guatemala City to the Mexican border—is under contract for grading, drainage and select material. The two latest awards went to Thompson-Cornwall, Inc., New York, and Fischer Contracting Co., Phoenix. And additional contracts are scheduled to be awarded for base course construction and surfacing. At present, 84 mi of Guatemala's 317-mi section are paved; 208 are all-weather; 25 are impassable. Completion cost is estimated at $37.5 million.

El Salvador—In July El Salvador will complete the last stretch of its 195-mi section to standards established for the highway. To date, 174 mi are paved and 21 are all-weather.

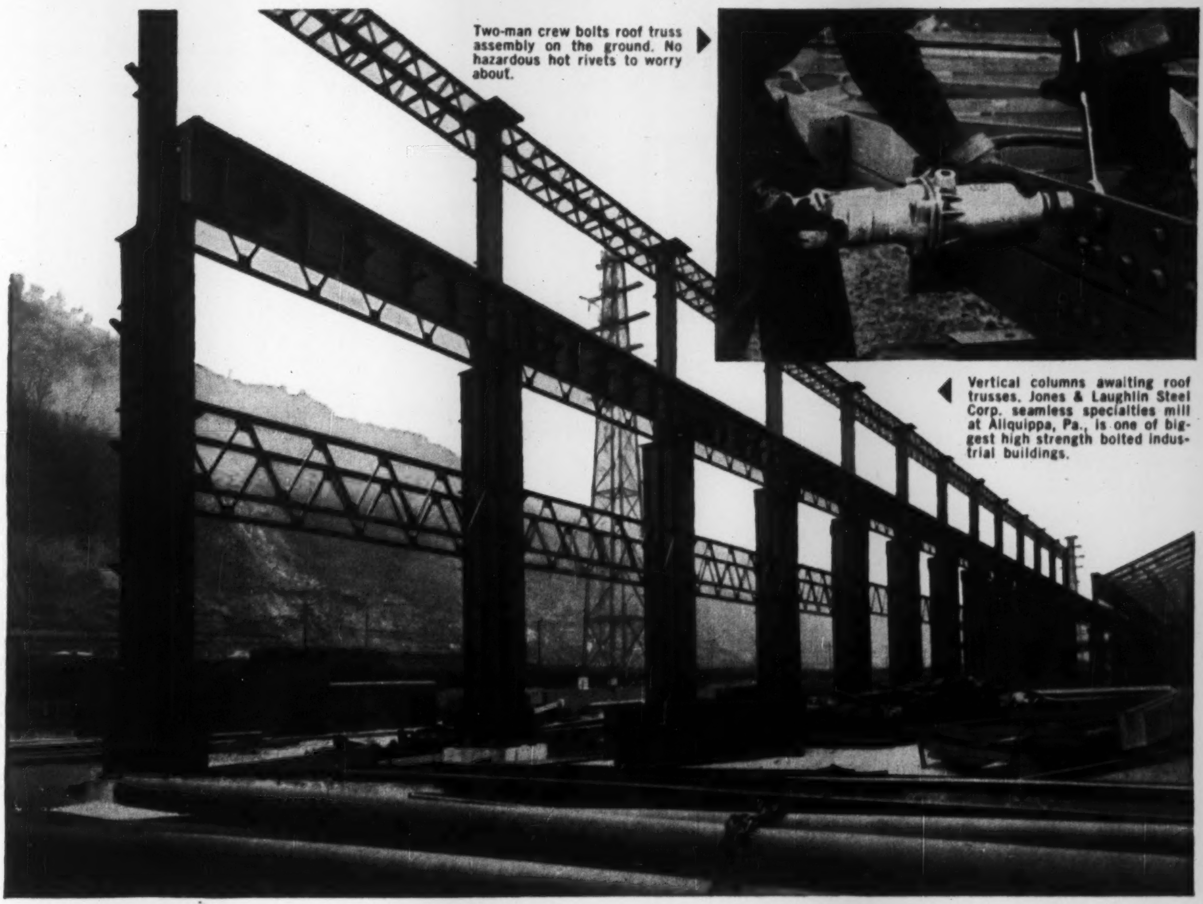
Honduras—Bids were advertised in March for the first work on the high-



Wide World Photo

Freeway for Tokyo

A three-level reinforced concrete motor freeway under construction in downtown Tokyo is planned to relieve traffic congestion in Japan's capital. Lower level straddles one of the centuries-old canals that thread through the city; upper two levels will handle one-way traffic in each direction.



Two-man crew bolts roof truss assembly on the ground. No hazardous hot rivets to worry about.

Vertical columns awaiting roof trusses. Jones & Laughlin Steel Corp. seamless specialties mill at Aliquippa, Pa., is one of biggest high strength bolted industrial buildings.

Steel producer chooses
HIGH STRENGTH BOLTS for own plant

STEELWORK for new addition to Jones & Laughlin Steel Corp. facilities was erected by the *modern* method . . . high strength bolting. Over 60,000 RB&W high strength bolts were installed in this 1050-ft. long structure. They were used instead of rivets not only to speed construction but also to develop optimum joint strength.

High tension bolts, once tightened to recommended tension, *stay* tight. Residual tension clamps members so securely, it prevents slippage . . fortifies bolts against fatigue failure from vibration and dynamic loading due to operation of cranes and heavy equipment. Stronger in shear and stronger in tension, RB&W bolts are approved by the AISC for use in place of rivets anywhere.

Largest independent producer of high strength bolts for construction, RB&W supplies bolts noted for uniform high quality and ease of assembly. They're completely reliable for any type of joint in buildings, bridges or equipment.

More information in Sweet's Architectural or Industrial Construction File. New Bulletin HS-1 gives quick facts on how to work with these fasteners. Write for copies for yourself and your men.

Russell, Burdsall & Ward Bolt and Nut Company, Port Chester, New York.

RB&W
110th year

Plants at: Port Chester N. Y.; Coraopolis, Pa.; Rock Falls, Ill.; Los Angeles, Calif. **Additional sales offices at:** Ardmore (Phila.), Pa.; Pittsburgh; Detroit; Chicago; Dallas; San Francisco. **Sales agents at:** Milwaukee, New Orleans, Denver, Seattle. **Distributors** from coast to coast.

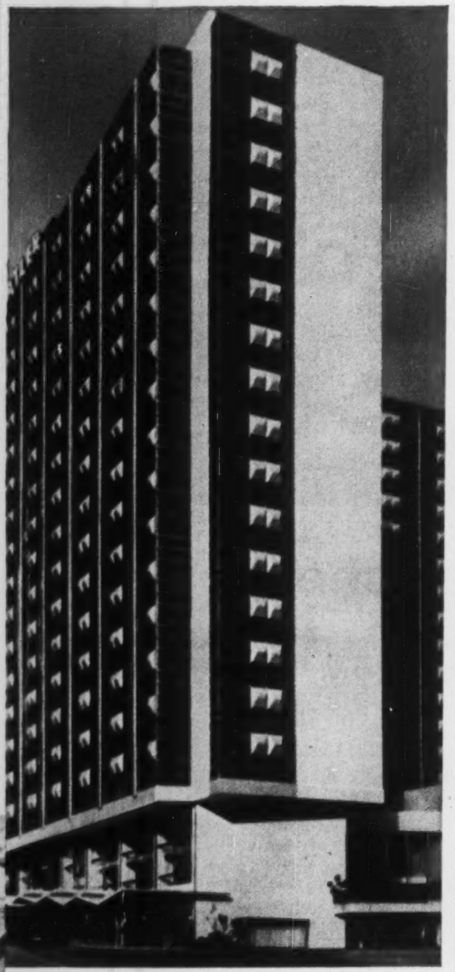
New Statler Hotels Leakproofed With "THIOKOL" Based Caulking Compound

The modern window wall construction of the Statler-Hilton Hotels at Dallas, Texas, and Hartford, Connecticut demanded a caulking compound capable of leakproofing this type of structure.

For sealing the aluminum window frame to the concrete opening, a "Thiokol"-based compound manufactured by Products Research Company, PRC Window Sealant was chosen.

"Thiokol" liquid polymer, the basic ingredient of this compound is a solventless liquid that converts at ordinary temperatures to a resilient rubber. It insures a tenacious, durable seal even after years of weathering . . . and maintains resilience and adhesion at temperatures ranging from 250° above to 65° below zero.

To insure leakproof construction, take advantage of "Thiokol"-based glazing and caulking compounds. Information will be sent to you on request. WRITE: THIOKOL CHEMICAL CORPORATION, 784 North Clinton Avenue, Trenton 7, New Jersey. IN CANADA: Naugatuck Chemicals Division, Dominion Rubber Company, Elmira, Ontario.



Thiokol Chemical Corporation manufactures "Thiokol" Liquid Polymer only as a raw material. The PRC Window Sealant (aluminum) compound is manufactured by Products Research Company, 3126 Los Feliz Boulevard, Los Angeles 39, California.

Thiokol®

PIONEER MANUFACTURERS OF SYNTHETIC RUBBER

way that Honduras has undertaken since 1947. Construction will involve grading and drainage on a short section near the Nicaraguan border, plus widening and building the base course on a 20-mi sector between Cholateca and San Marcos. All of Honduras' 94-mi section now is all-weather. Completion cost is estimated at $5.8 million.

Nicaragua—Bids were advertised during March on construction of 10 bridges in the southern part of the country between Rivas and Costa Rica. The spans will replace those put up by Army Engineers in 1942 and 1943 as temporary wartime structures. Now, 132 mi of Nicaragua's 238-mi section are paved and 106 are all-weather. Completition cost is estimated at $5 million.

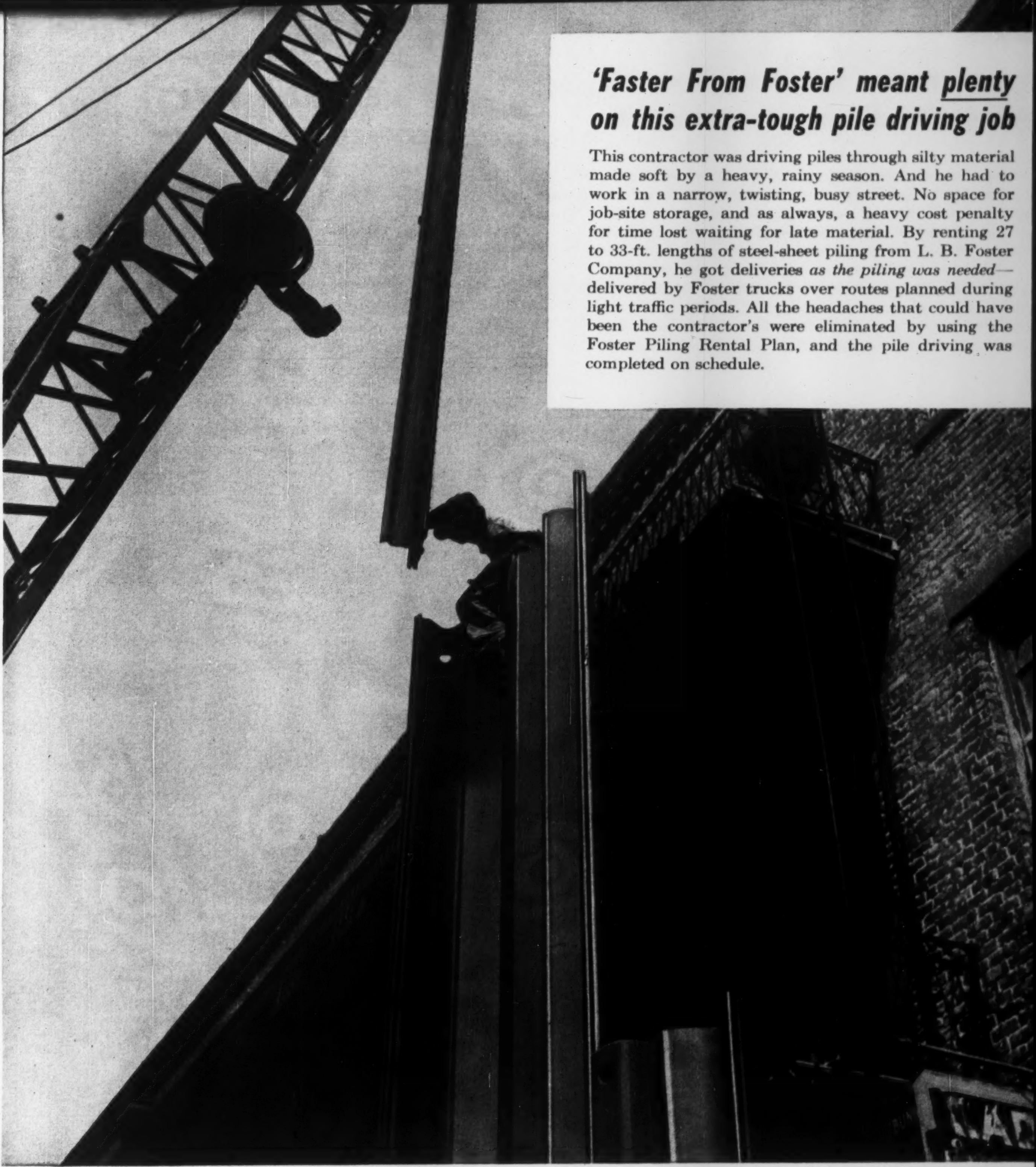
Costa Rica—A $9.5-million loan agreement recently signed with the Export-Import Bank has cleared the way for completion of the last 130 mi of Costa Rica's part of the highway. Bids were advertised during March for construction of a 30-mi sector in the canyon areas of the Diquis River, some 25 mi south of San Isidro. To date, 60 mi of Costa Rica's 413-mi section have been paved, 219 are all-weather and 134 are impassable. The completion cost figure is set at $27.9 million.

Panama—Panama recently called for bids on construction of base course, grading and drainage of a 30-mi link between Agua Dulce and Santiago. And it also has advertised for bids on a 25-mi section from Agua Dulce to Penonome. Of the 316 mi included in Panama, 98 are now paved, 204 are all-weather and 14 are impassable. Completion cost is estimated at $33.3 million.

Brazil Cuts Roadwork Funds To Meet High Budget Deficit

Faced with the reddest bankbook in the country's history—national deficit this year, $580 million (U.S.), nearly three times last year's—the Brazilian government is looking around for places to cut expenses. One of the first spots to get the monetary axe was the Highway Department, where this year's funds were chopped down 40% or a total of around $15-million.

The National Highway Plan will be curtailed considerably, the government says—but most of the cuts will come in the construction program for secondary roads. Considerable criticism is mounting over the cut because of the country's drastic need for hundreds of new roads in the interior.



'Faster From Foster' meant plenty on this extra-tough pile driving job

This contractor was driving piles through silty material made soft by a heavy, rainy season. And he had to work in a narrow, twisting, busy street. No space for job-site storage, and as always, a heavy cost penalty for time lost waiting for late material. By renting 27 to 33-ft. lengths of steel-sheet piling from L. B. Foster Company, he got deliveries *as the piling was needed*—delivered by Foster trucks over routes planned during light traffic periods. All the headaches that could have been the contractor's were eliminated by using the Foster Piling Rental Plan, and the pile driving was completed on schedule.

Foster Piling Rental Service is complete—for all types of steel-sheet piling (and lightweight piling). You get the right type, the exact section, the exact length . . . when you need it . . . and on the low fixed cost of our rental plan. Ask your nearest Foster office for details and prices on your temporary piling needs, and see for yourself the savings in the Foster Piling Rental Plan.

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Setting NEW RECORDS FOR LOW-COST CONCRETE CUTTING!

Cardinal CONCRETE-CUTTING BLADES

With more and more highway and airport contracts specifying *concrete cutting*, it's just natural that you should look to the source that can give you dependable guidance and service . . . the source that knows the business of concrete cutting blades.

The fact that CARDINAL BLADES did a phenomenal share of the cutting last year on the nation's highways and byways — that CARDINAL engineers have participated in months and months of test and actual cutting operations, gives some indication of how valuable CARDINAL experience can be to the contractor.

With the biggest highway and airport program in history JUST AHEAD the CARDINAL is at your service! Call or write today!

NEW YORK
400,000 Feet Cut
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WEST VIRGINIA
1,000,000 Feet Cut
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INDIANA
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Gravel Aggregate

KENTUCKY
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FLORIDA
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Cardinal DIAMOND BLADES

The CARDINAL 'KING SIZE' DIAMOND BLADE has unique distinguishing characteristics that make it top value for concrete cutting:
1—MAXIMUM DIAMOND CONCENTRATION that assures maximum abrasive contact on the cutting edge at all times;
2—25% LARGER (Full ¼") SEGMENTS to give you at least one-third more cutting life; 3—HI-RETENTION BONDS to hold the diamonds in the segments longer.

Cardinal ABRASIVE BLADES

The amazing wet-cutting CARDINAL ABRASIVE CONCRETE BLADE has in most cases surpassed the cost-per-foot cut-ability of competitive diamond blades on certain aggregates. It of course is much lower in initial cost and therefore is worthy of consideration whenever there is an application for it. This blade is especially reinforced for hard, rough usage and combines a special hi-efficiency blend of abrasives in a hi-retention bond . . . for superior cutting and long life.

Cardinal ENGINEERING CORPORATION

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Distributors and Sales Offices in Principal Cities**

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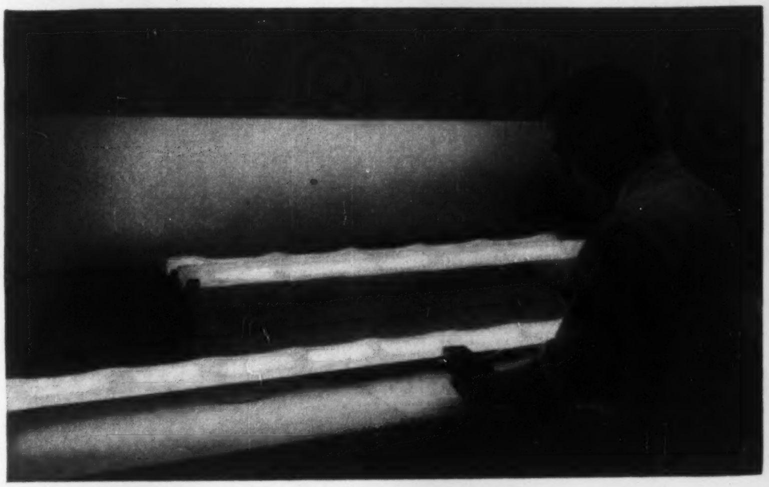


Grooved Lamp Doubles Light Output

Development of a new fluorescent lamp overcomes a barrier that has been plaguing lighting engineers for years—to get more light from fluorescent tubes without sacrificing efficiency. The new lamp has double the light output of present tubes of equal length and achieves this gain with no loss in efficiency.

Key to the lamp's new properties is its shape. Rather than a circular cross section, it has a horseshoe shape, being grooved along its length on one side. This groove is broken by transverse bridges to give the tube added physical strength.

Called Power-Groove Fluorescent Lamps, the new 8-ft long, 200-watt tubes will become available in the fall. They are 2⅛ in. in dia and have double-contact recessed-type bases. The manufacturer points out that they will not be interchangeable with other lamps. New lampholders, fixtures and ballasts will be required. In contrast to the company's previous most economical lamp (high-output type), the new lamp provides a 20% savings in initial cost and a 10% savings in overall cost.

Recommended applications are:

- General lighting—stores, offices and industrial areas.
- High mounting heights—high-bay areas, previously restricted to incandescent and mercury sources, now can take advantage of fluorescent lamps.
- Limited space uses—lighting levels can be doubled in valances, coves, floodlighting units, and wherever maximum light is needed but space restricts the number of light sources.
- Outdoor applications—street lighting, sign lighting, building front lighting, where more light is needed. Lamps operate well at low temperatures.

• **Why new shape**—Basically a fluorescent lamp is a glass tube coated on the inside with fluorescent powders. The light is generated by an arc in the atmosphere of mercury vapor. A drawback is that the mercury vapor interferes with its own generated light, tending to kill or shadow it. Engineers get around this by keeping the volume of the tube low (thin tube) and maintaining an ideal vapor pressure. This means less mercury vapor through which the radiations from the arc stream must pass.

A logical way to get more light from a tube would be to increase the wattage loading per foot of lamp. However, this increases the temperature of the tube and the vapor pressure, thus cutting down the light and reduces efficiency. With the increased section perimeter of the new tube, the scientists have solved the problem; they have increased surface area of the tube to dissipate heat and maintain vapor pressure, without enlarging the volume of vapor inside the tube. General Electric Co., Nela Park, Cleveland 12, Ohio.

Tilting Platform Trailer For Fast Loading, Unloading

Designed to handle smaller shovels, trenchers and finishers and similar medium-heavy equipment, a new heavy duty, tandem axle, tilting trailer with 13-ton capacity, is now on market.

Ease of maneuverability of this type of trailer in backing or turning and fast hauling are advantages claimed by the manufacturer. The 8 ft x 16 ft 8 in. oak decked platform is only 33 in. in height. Miller Tilt-Top Trailer Co., 434 S. 92nd Street, Milwaukee 14.

Automatic Blower Makes Insulating a One-Man Job

One-man operation highlights an automatic insulation blower, called the Universal Ultra-Matic. The machine, which blows all types of mineral wool and many other types of insulation, has a magnetic disc-type clutch for remote control by the hose man.

A sliding baffle between the shredder and feeder provides eight-

Shale Concrete Planks Are Precast, Cored and Grooved

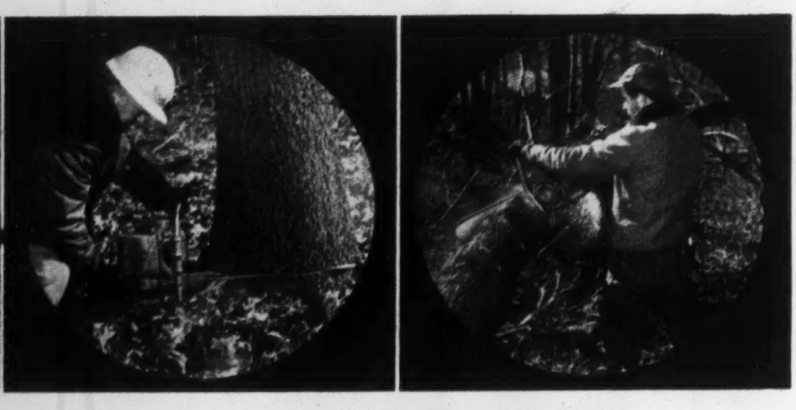
Hollow-core, reinforced concrete floor and roof planks are being precast with Haydite aggregate and sold under the name "Rapidex." Haydite is an expanded shale.

The planks are precambered, tongue and groove matched, and grooved along top edges to form grout slots at the joints. Hollow cores accommodate piping and conduits and serve as air ducts. Standard sizes are 10, 12 in. wide, 6, 8 in. thick.

Heat-transmission coefficient, U, is 0.34 for 8-in. plank, 0.37 for 6-in. Fire resistance meets 2-hr rating requirements, according to the makers.

Underside of planks can be painted and left exposed. Sound absorption is said to that of ½ in. acoustical tile. Rapidex Corp., 1100 E. 52d St., Indianapolis.

New
HOMELITE
EZ



...the Direct-Drive CHAIN SAW with ALL of the features YOU want

Only 19 pounds

Full 5 Horsepower

New Low Cost

Faster Cutting Speeds

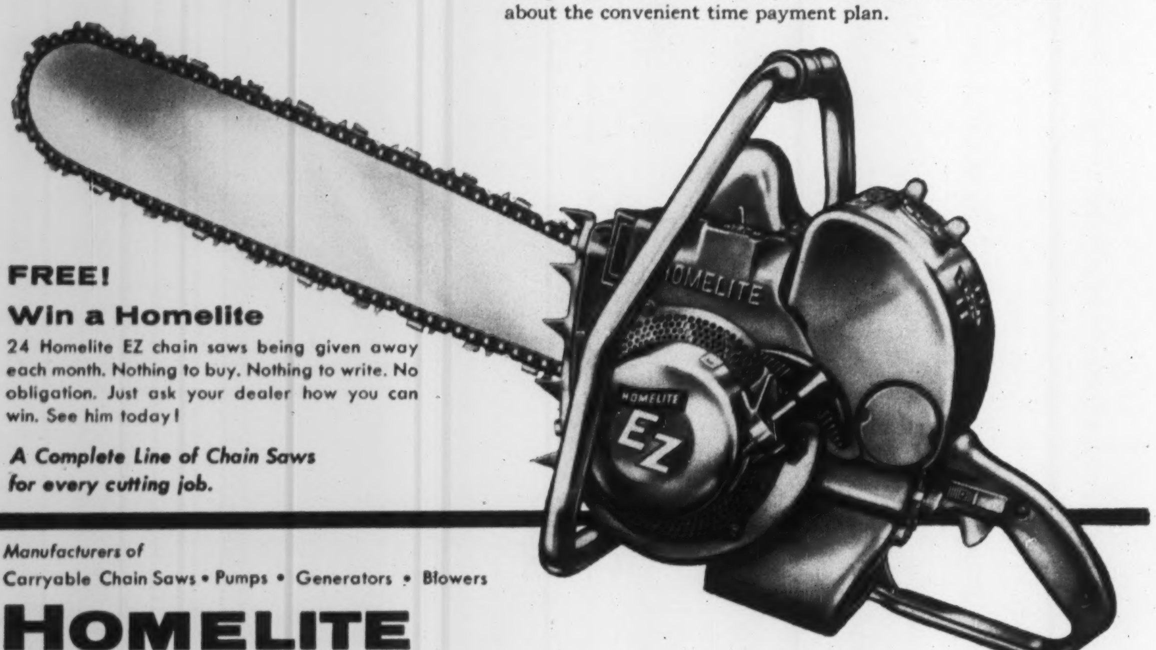
AND WITH THE NEW HOMELITE FLOATING POWER, you'll find handling ease you never knew before. The all-angle, any-position carburetor gives you full power cutting — whether you're felling, bucking, notching, limbing or under-cutting.

Floating Power lets you cut with less effort, less fatigue than any other chain saw. Because the Homelite EZ weighs only 19 pounds you can carry it anywhere. Its full 5 horsepower cuts through 8″ Oak in 5 seconds and 18″ Pine in 14 seconds. And the three bar sizes — 17″, 21″ and 25″ will handle trees up to 3 feet in diameter.

The EZ brings you Homelite dependability at a new low cost — not just a low initial cost, but also lower maintenance and operating costs than any other direct-drive chain saw.

See this new floating power now! Try it and you'll know why the Homelite EZ offers easier cutting, faster cutting, more profitable cutting for your dollar.

Ask your Homelite dealer for a free demonstration. Also ask about the convenient time payment plan.



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Win a Homelite

24 Homelite EZ chain saws being given away each month. Nothing to buy. Nothing to write. No obligation. Just ask your dealer how you can win. See him today!

A Complete Line of Chain Saws for every cutting job.

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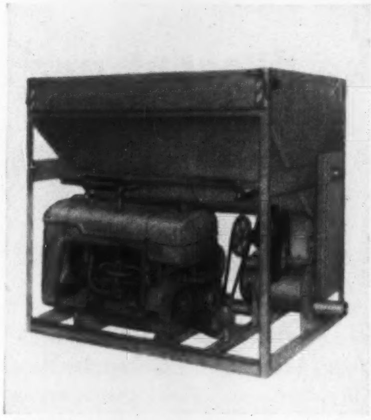

BLOWER design is clean and simple.

speed gravity feeding. For blowing out and cleaning the hose, the baffle can be set to shut off the feeder completely.

Simplified design eliminates the need for conveyor, transmission and gears. Use of sealed ball bearings does away with all lubrication except ordinary engine and blower care. Shear keys, replaceable in 30 to 60 seconds, provide protection for the feeder and hopper agitator.

Four models of the machine are manufactured. IH-47, with 2½-in. blower, and IH-59, with 3-in. blower, are powered by 17-hp, air-cooled engines. W-47 and W-59, with 2½ and 3-in. blowers, respectively, operate on 15-hp, air-cooled engines. Universal Insulating Machine Co., Van Wert, Ohio.

Corrugated Plastic Panel Proves Tough in Tests

To prove that a newly developed glass-fiber-reinforced building panel was tougher than ordinary plastic panels, its manufacturer subjected it to sandblasting and acid-immersion tests. Purpose was to simulate the long-time effects of rain and sleet erosion. According to the manufacturer of the new panels, called "Granitized" Corrulux, the product was virtually unaffected by the acid—compared to competitive samples that badly eroded—and withstood sandblasting much longer.

The surface of the panel produced by the "granitizing" process consists of minute polyester facets that protect the glass-fiber reinforcement of the section. And, the texture that results is a pleasing one.

It is claimed that the superior erosion resistance of the panels will assure higher levels of light transmission in skylights, sidelights, awnings, and other installations exposed to the weather. Corrulux Division, L-O-F Glass Fibers Co., P. O. Box 20026, Houston 25, Texas.

Panels of Pressed Wafers Contain No Ground Wood

Thin wood wafers plus a chemical resin are bonded under heat and pressure to produce a new interior board that is claimed to differ radically from conventional particle or hard boards. With a distinctive pattern all its own, the new product contains neither ground nor defibrated wood usually found in pressed panels.

Tradenamed Tenex, it is available in 4 x 8-ft and 4 x 16-ft sheets, ¼-in. thick. The manufacturer reports that laboratory tests and actual wood usage demonstrate that the wood can be handled and worked the same as ordinary wood and with the same tools. Also, conventional wood finishes, such as paints, shellacs, and varnishes, may be used over the wafer-board surface. Pack River Lumber Co., P. O. Box 391, Sandpoint, Idaho.

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from a full line of
HOMELITE
Carryable
Construction
Equipment

SELF-PRIMING CENTRIFUGAL AND DIAPHRAGM PUMPS
Sizes: 1½" to 3" — capacities to 15,000 g.p.h. for dewatering and water supply.

ELECTRIC GENERATOR SETS FOR TOOLS AND LIGHTS
Complete range of sizes and voltages up to 5,000 watts.

LIGHTWEIGHT POWERFUL ONE-MAN CHAIN SAWS
Complete line of saws with clearing and brushcutter attachments for every woodcutting job.

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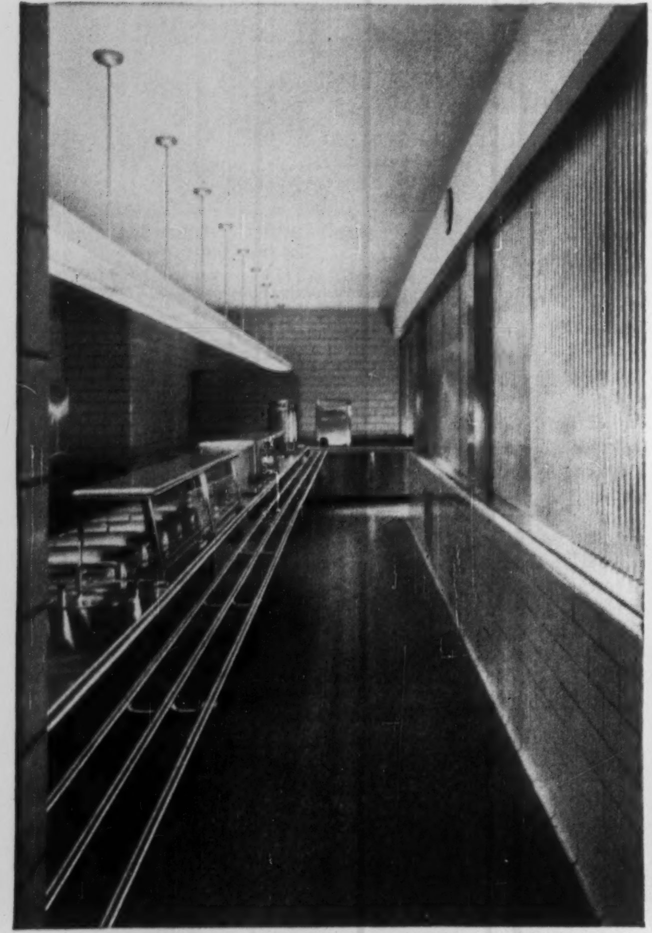
Kent State University designed for the present and

ENDURO STAINLESS



Terrace Hall Cafeteria is the largest all-stainless steel food service in Northeastern Ohio. ENDURO is used throughout for serving lines and kitchen. Two separate units can serve 4,500 meals a day.

With college enrollments at an all-time high and expected to go even higher, student feeding has become "big business." Food preparation and handling facilities must be designed for maximum efficiency and productivity.

Fully aware of these facts, officials of Kent State University and the architects planned not only for the present but also for the future by designing all of the advantages of ENDURO Stainless Steel into Terrace Hall Dormitory and Cafeteria.

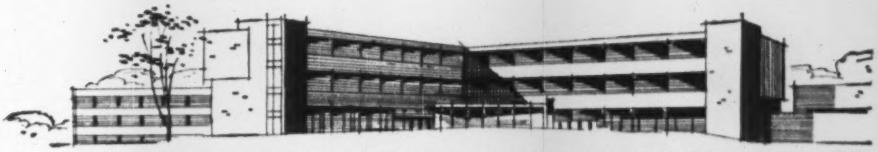
Otto Pedersen, Director, Food Service, believes that in addition to providing labor-savings and longer life, stainless steel also creates

Range tops, sinks, storage racks, work surfaces, deep fat cookers, ventilating hoods and meat hangers are fabricated from ENDURO Stainless Steel. Equipment is mounted on legs which permit easy cleaning and allow air circulation. Well-defined, open aisles maintain smooth traffic flow.

REPUBLIC

REPUBLIC STEEL ®

World's Widest Range of Standard Steels



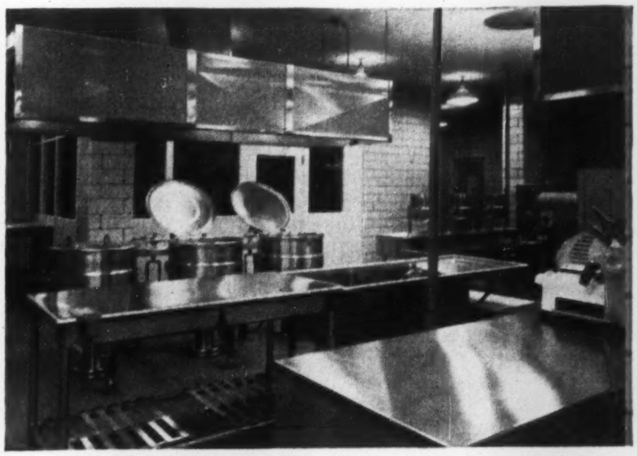
Terrace Hall, Kent State University, Kent, Ohio; *Architects*—Fulton, Krinsky & Dela Motte—Cleveland, Ohio; *Kitchen Contractor*—C. F. Thorsson—Cuyahoga Falls, Ohio

future...with STEEL...

a strong morale factor in the employees' attitude toward sanitation and cleanliness. This factor, in itself, more than offsets any increased initial cost over other materials.

Your role in planning and designing food-handling facilities is rapidly increasing in scope. Republic offers you the services of its metallurgical and engineering staffs in helping you obtain the best possible use of ENDURO Stainless Steel.

Sweet's Architectural File, section $\frac{6c}{Re}$ has all the facts on architectural applications of ENDURO Stainless Steel. Or send coupon for more information.



ENDURO Stainless Steel equipment has smooth, rolled edges and, wherever possible, stands away from the wall to help prevent accumulation of dirt, etc. Flush tile floors are well-equipped with stainless steel drains to meet sanitary requirements.

MORE REPUBLIC PRODUCTS FOR MODERN ARCHITECTURE

$3.54 SAVING PER OPENING on fuel and air-conditioning costs in the Socony Mobil Building is provided by Truscon's stainless steel reversible window. Tests have proved the window 80 times more resistant to air leakage than allowable industry standards. Truscon® Engineers will help you adapt this window to your requirements. Write for fact and specification file.

MORE SAVINGS IN LIGHTER FRAMING AND FOOTINGS are possible with the new Truscon Clerespan® Steel Joist. To meet all types of loading conditions, it utilizes a Warren-type truss. Joist depth is standardized at 18″ to 48″. Open webs provide passage for and concealment of ducts, pipes, electrical conduit. Send for new Truscon catalog, E-280, which gives you all the facts on Clerespan Steel Joists up to 96 feet in length.

REPUBLIC STEEL CORPORATION
Dept. C-1462
3114 East 45th Street
Cleveland 27, Ohio

Please send more information on:
- ☐ ENDURO® Stainless Steel for Architectural Applications
- ☐ Truscon Stainless Steel Reversible Windows

Also send:
- ☐ Truscon Clerespan Steel Joist Catalog E-280.

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Company________________

Address________________

City__________ Zone____ State______

STEEL

and Steel Products

Constant Torque Capacity

for entire life of friction material

Lipe CONSTANT-CAPACITY CLUTCH OF THE NON-ADJUSTABLE TYPE

The Lipe Constant-Capacity Clutch uses a unique application of the toggle-lever principle: Compensates for fading pressure of expanding springs . . . maintains maximum torque capacity throughout life of frictional material.

The constantly increasing ratio of the toggle levers — which never go over center — compensate for the loss of pressure due to spring expansion. So long as there is enough frictional material to hold, the Lipe Constant-Capacity Clutch of the non-adjustable type does not lose torque capacity.

Every Feature of This Clutch Gives You Extra Service

Engages gently because the toggles absorb the initial energy of the springs . . . and because the speed of the toggle action fades as the pressure plate approaches the friction element.

It has a high thermal efficiency because the massive plate, ribbed for rapid radiation, is cooled by positively generated air currents.

The pressure plate and friction element are always parallel. Non-adjustable, serviced without special tools.

Write for detailed specifications and performance data.

LIPE ROLLWAY

Lipe-ROLLWAY CORPORATION

Manufacturers of Automotive Clutches and Machine Tools

Syracuse 1, N. Y.

Publications

Steel dock—A new 20-page booklet describes De Long jacks and De Long technique of dock construction, of which the famous "Texas Tower" off Boston is one application. Other illustrated installations include piers, wharves and drilling platforms, and predictions of new applications to come. Mrs. Dorothy Duffy, De Long Corporation, 29 Broadway, New York 6, N. Y.

Trailer development—A brochure illustrates complete line of trailers adapted to uses of the construction industry. Covered in the four-page folder are latest developments in dump trailers, carryalls, bulk cement handlers, platform units, pole trailers and other types. Advertising Department, Fruehauf Trailer Co., 10940 Harper Ave., Detroit 32.

Truck service guide—A two-color 32-page bulletin gives the truck service shop accurate time and cost comparisons for doing a number of common service jobs by hand and with air and electric Impactools. With this guide, a truck service shop can evaluate more accurately its present service equipment and determine in advance the actual savings that it may expect through using the air and electric tools. Ingersoll-Rand Co., 11 Broadway, New York, N. Y.

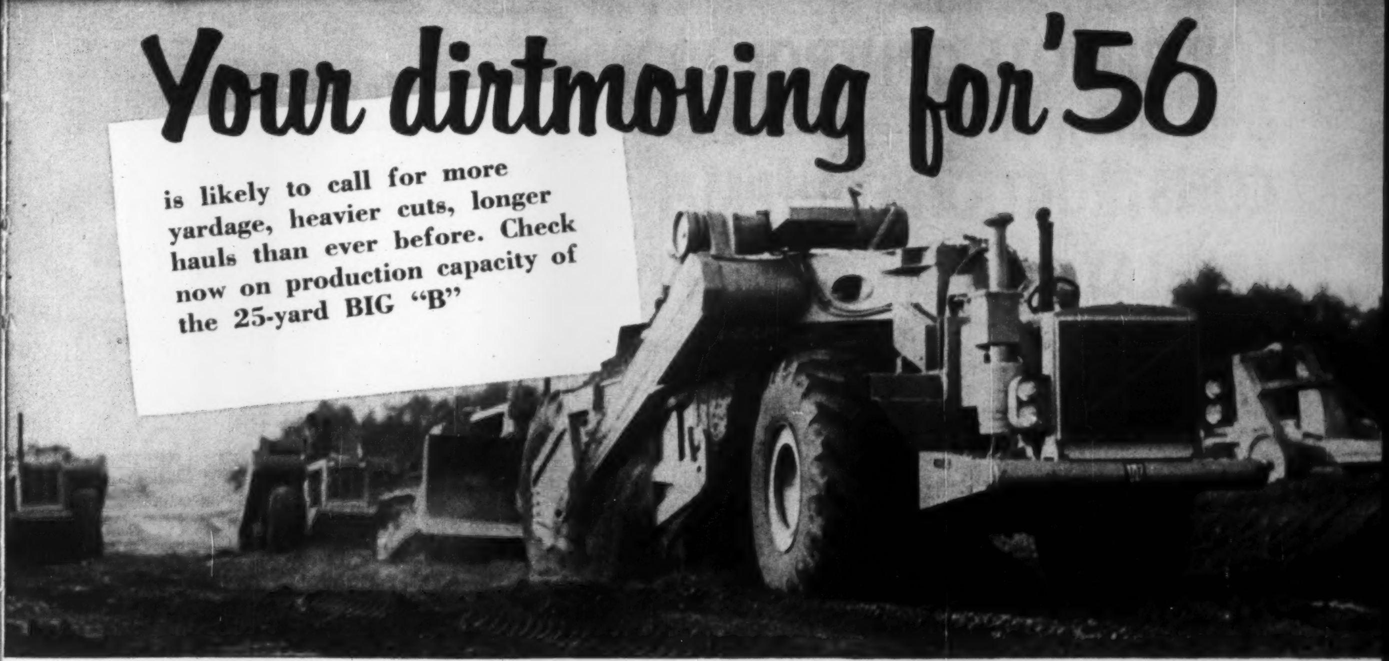
Slashes handling cost—A new pamphlet for masonry contractors, "Why Palletize" has just been released, to show that palletizing slashes material handling costs even when done on site by the contractor. American Road Building Equipment Co., 4302 N. 28th St., Omaha, Neb.

Draglines—Bulletin 5616 illustrates a new line of walking draglines with diesel power, and a dredger that only draws 24 in. of water when fully loaded. Features described are V-type horizontal diesel power, stronger boom supported by Becket staff, cables at three points and centralized lubrication system. Macwhyte Co., Public Relations Department, Kenosha, Wis.

Safe loads—In the newly revised bulletin 5308-R, are listed safe loads for slings of twenty sizes of wire rope, when used at various angles of application. Information is listed to cover slings varying from ½ ton safe load to 48.7 tons safe load. Macwhyte Company, Sling Department, Kenosha, Wis.

Your dirtmoving for '56

is likely to call for more yardage, heavier cuts, longer hauls than ever before. Check now on production capacity of the 25-yard BIG "B"



B Tournapull's weight-distribution puts 56% of loaded scraper weight on drive wheels . . . makes loading easier.

10-gear speed selection

Speeds from 2.4 to 28.4 mph, plus clutch-brake for fast shifting, means more trips per hour. Double-clutching and gear-clash are eliminated Low speed range aids in synchronizing with pusher for fast loading, gives better grade-climbing.

Faster, easier loading

Low push-block has direct-line thrust to blade. Scraper hoist control gives fast pumping in loose materials. Rear deflector-plate heaps loads. Blade angle, weight-distribution, speed loading. Welded box-beam construction takes stresses of fast loading.

Works when other rigs shut down

High percentage of loaded weight on drive-wheels boosts traction. Power-steer through geared kingpin, power-transfer differential, big tires help pull through tough going. Electric controls are weather proof, not affected by rain, dust, cold, heat.

Longer tire life

"B" tires provide ample safety margins. Overinflation is not necessary on "B". Check tire ratings against loaded weight before you buy. Overloaded tires cause overheating and result in excessive wear.

Power where needed

Electrical controls apply power where needed with minimum friction loss. Dashboard push-buttons produce instant action. Maintenance is simple . . . no long cables with multiple reverse bends, to wear, no complicated hydraulic system to leak.

Shorter turns

"B" maneuvers in closer quarters than other big scrapers. This big machine turns around in only 35′. Easy power-steer controls this big rig with no effort. Machine turns fast . . . maneuvers easily, safely, at high speed, with big loads.

Faster, easier servicing

Accessibility is tops in the "B". All components are easy to get at and service. You don't need to take whole machine apart to remove working parts. Fewer fittings and check points reduce lubrication time.

Safe, easy operation

Fingertip electric controls let operator work faster, with less fatigue. Good visibility, ease of operation, low center of gravity, big disc-type brakes make Tournapull exceptionally safe to operate. More than 4 times braking surface per-ton-of-weight than others in its size class. Good "B" operators are easy to get and keep.

Interchangeable equipment

Same "B" prime-mover pulls interchangeable 35-ton rear-dump. You get double value by keeping your 2-wheel tractor hauling either shovel rock or scraper dirt. Bodies use same wheels, tires, brakes, and electric controls. Change takes only few hours.

Investigate the BIG "B" now and place orders early if you want spring delivery! *The time to buy is now.*

Wide and high apron-opening, plus positive-ejection tailgate, gets big 25-yard loads out fast.

Tournapull—Trademark Reg. U.S. Pat. Off. BP-958-G-b

LeTourneau-WESTINGHOUSE Company

Peoria, Illinois

A Subsidiary of Westinghouse Air Brake Company

FOR REMOTE CONTROL JOBS on a great variety of CONSTRUCTION EQUIPMENT

TRU-LAY Flexible PUSH-PULLS

• Adaptability to all sorts of mechanical situations explains, in large measure, the wide-spread use of TRU-LAY PUSH-PULLS on tractors and their accessories, power shovels, winches, road graders, road oilers, dump trucks, snow plows, engine-driven pumps, rock crushers, etc.

On construction equipment these dependable Push-Pulls are used for the remote control of hydraulic and air valves, brakes, clutches, transmissions, throttles, chokes, governors, power take-offs, and on many other applications.

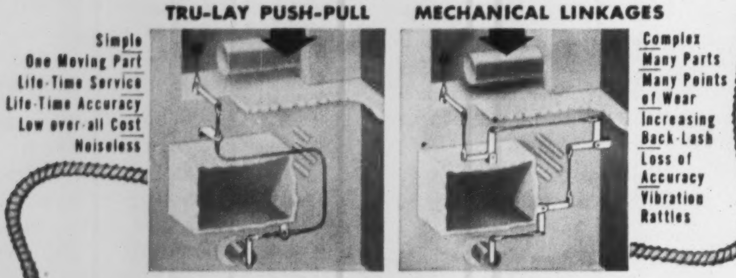
TRU-LAY PUSH-PULLS are precision products, not gadgets. They provide positive remote-action whether anchorages are fixed or movable . . . for light loads or loads up to 1,000 lbs. . . . and they are effective over short or long distances up to 150 feet or more.

• • •

For complete information and details, write for DATA FILE.

"**Solid as a rod but flexible as a wire rope**" is a good description of TRU-LAY PUSH-PULL REMOTE CONTROLS. This flexibility makes it possible to snake around obstructions . . . permits the ideal arrangement of all control elements . . . greatly simplifies installation of controls by reducing the number of working parts . . . damps out noise and vibration. Versatile, accurate, adaptable, rugged . . . they are the ideal remote controls for construction equipment.

Advantages of Tru-Lay Push-Pull flexibility and simplicity are pictured below—



TRU-LAY flexible PUSH-PULLS are dependable and accurate even under the most adverse conditions. They perform effectively under extremes of heat or cold . . . from jet engine temperatures to 70° below zero F. The inner, working member (lubricated for life during assembly) is fully protected by the tough, flexible conduit. Abrasive dusts, dirt and moisture are sealed out. Fittings are cold-swaged to make them integral parts of the control unit. It is a matter of record that we have never heard of a TRU-LAY *flexible* PUSH-PULL wearing out in normal service. Use of these versatile, simple and rugged controls means the virtual elimination of maintenance.

Our DATA FILE will answer your further questions
Write for a copy without obligation

Push-Pull DATA FILE

ACCO

AUTOMOTIVE and AIRCRAFT DIVISION
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Men and Jobs

Capt. W. C. G. Church

Capt. W. H. Godson

Command in Spain

Capt. Church takes over military base work from Capt. Godson this month

Capt. W. C. G. Church, who will report at Madrid this month, has been appointed Officer in Charge of Construction of the military bases in Spain. He will relieve Capt. William H. Godson, Jr., CEC, USNR, who retires from the naval service October 1.

Capt. Church, a graduate of the Naval Academy, received his post graduate instruction in civil engineering at Rensselaer Polytechnic Institute. He has just completed duty as Commanding Officer of the Naval Construction Battalion Center at Port Hueneme, California. His Navy serv-

"GREAT" for all-around utility work

says Supt. on Garden State Parkway contract

On their 14 mile section of the Garden State Parkway in Cape May County, New Jersey, Public Constructors, Inc., Pleasantville, are using a 19 mph rubber-tired Tournatractor for all-around utility work.

This 208 hp tractor works all over their widely-scattered 2¼ million-yard sand job. It often moves ahead of the company's 33 scrapers to clear trees and brush and handle pioneer dozing. At times, it is used to level cuts and fills and to doze around bridges and culverts. Because of its speed and maneuverability, tractor-on-rubber performs these utility assignments without interfering with production dirtmoving.

Besides leveling work, Tournatractor is also used to push-load some of the contractors' 11 C Tournapulls. Where material is pure white sand, tractor's fast pusher-service loads the 16-yd. "C's" in as little as 45 seconds.

Used for other scattered jobs

Tournatractor is always ready for emergency calls, too. Jobs 5 miles away can be reached in 20 minutes (or less) due to its 19 mph speed. Cleaning haul roads and dozing fill on distant sections of the job are handled quickly and efficiently. Paved highways present no travel problems for the tractor-on-rubber. It goes everywhere under its own power . . . needs no blocking, planking, trailer-loading and unloading. For all around utility service, it "gives a great performance day after day," says Supt. John Franks.

Discover for yourself why the fast, mobile Tournatractor is ideal for utility-type assignments, as well as major tractor work. Phone or write for a demonstration on your job, today. There's no obligation.

Tournatractor, Tournapull—Trademark Reg. U.S. Pat. Off. T-837-H-b

Tournatractor, with its 4-wheel drive, push-loads 16-yard C Tournapull in 45 to 60 seconds. Big low-pressure tires provide plenty of traction and flotation even in this poor, sandy footing.

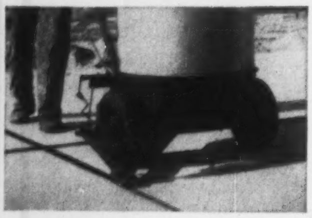
LeTourneau-WESTINGHOUSE Company

Peoria, Illinois

A Subsidiary of Westinghouse Air Brake Company

Toughens up fast...
Seals joints that last

FLINTSEAL*...use it for old and new pavement



There's no traffic hold-up when you re-seal the joints of old pavements with Flintseal hot-poured rubber asphalt thermoplastic compound.

Normal traffic is resumed quickly because Flintseal *toughens up* as soon as it cools to air temperature. *Within 15 to 30 minutes.*

And Flintseal gives you *positive, dependable* sealing of all joints and cracks. It doesn't flow or extrude in summer . . . crack or pull away in winter. Flintseal bonds perfectly through all extremes of weather. Prevents water and dirt from getting under pavements . . . far more effectively than old-style tar and asphalt fillers.

Use Flintseal for concrete highways, streets, drives, bridge decks and airports. Count on this compound to keep maintenance costs down. One application will last for years and years. (Meets Fed. Spec. SS-S-164.)

Flintseal JFR, a special jet-fuel-resistant joint sealer is available for critical areas of airfields. (Meets Fed. Spec. SS-S-00167.)

Ask for literature and application data for Flintseal (regular) and Flintseal JFR (jet-fuel-resistant).

*Reg. U.S. Pat. Off.

FLINTKOTE

THE FLINTKOTE COMPANY, INDUSTRIAL PRODUCTS DIVISION
30 Rockefeller Plaza, New York 20, N. Y.

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In Toronto, Ontario: THE FLINTKOTE COMPANY OF CANADA, LTD.
In London, England: Industrial Asphalts Company, Ltd.

ice has included duty with the Seabees in the Pacific during the World War II; construction supervision at Barstow, Calif. and Hawthorne, Nev.; and service as Deputy Director, Pacific Division, Bureau of Yards and Docks for Administrative Management.

Capt. Godson received his civil engineering degree from Syracuse University. In the period before World War II, he served with various Eastern construction companies. He was commissioned in the Civil Engineer Corps, U. S. Naval Reserve in 1940.

Since then, he has served with the Second and Seventh Naval Construction Brigades in the Pacific; with the American Mission for Aid to Turkey; as Liaison Officer, Joint Construction Agency, Paris, France; and as Officer in Charge of Construction of the Naval Air Missile Test Center at Point Mugu, Calif.

When he returns from Madrid, Capt. Godson will report to the Atlantic Division of Bu Docks in New York. Because of wartime service as commodore, he will retire with the rank of rear admiral.

Federation Planned

Consulting engineers propose formation of national federation of associations

Preliminary steps have been taken to form a national federation of associations representing consulting engineers.

The idea was initiated last October at the National Convention of Associations of Consulting Engineers, held in St. Louis, Mo. Since then, an interim steering committee has drafted a proposed constitution and by-laws, which are now being circulated to ten tentative charter members. The founding convention of the new federation—to be known as the National Federation of Associations of Consulting Engineers—is scheduled to convene in Tulsa, Okla., on July 6.

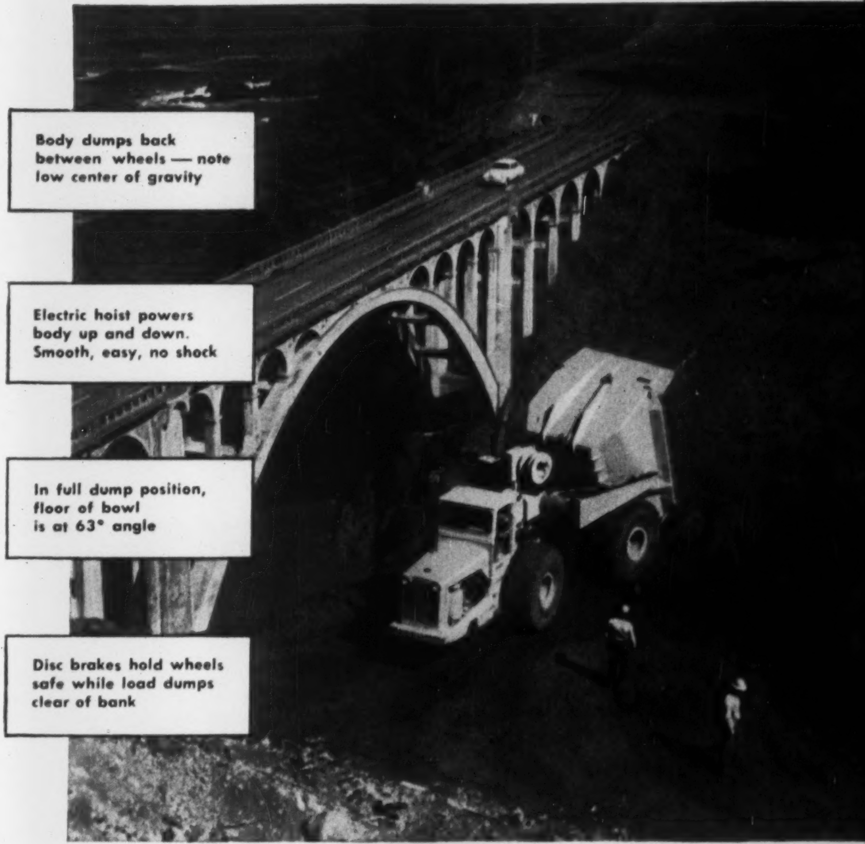
The committee, under the chairmanship of John K. M. Pryke (president of the New York Association of Consulting Engineers), is seeking the active cooperation of the American Institute of Consulting Engineers, which it hopes may become a charter member of the new federation. It expects the proposed federation to cooperate wholeheartedly with the National Society of Professional Engineers.

According to Pryke, a recent poll of consulting engineers reflected the feeling that NSPE, a predominantly

Dumps anywhere — over-the-edge or on-the-move

Tournapull Rear-Dumps can go anywhere—on or off-the-highway—to place loads exactly wherever you want them.

To dump over the edge of bank, all you do is back close to dump point. Rig's big single tires and power steer take you over rough footing and soft fills where many trucks can't go. Dump is made by flicking electric switch on control panel. This instantly activates hoist motor. Body "rocks" back easily over rear axle. You have power up and power down. Movement is under positive cable control at all times, can be stopped at any angle. At full dump angle, bowl lip is at ground level *behind* rear wheels. This position prevents material from rolling forward under wheels. It also provides free dump over edge of bank and greatly reduces need for dozer cleanup.



Body dumps back between wheels — note low center of gravity

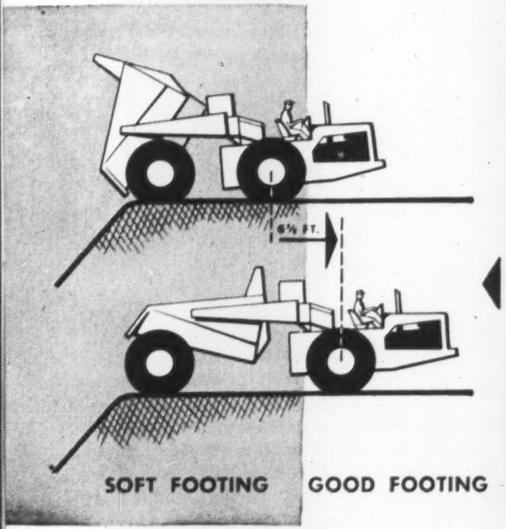
Electric hoist powers body up and down. Smooth, easy, no shock

In full dump position, floor of bowl is at 63° angle

Disc brakes hold wheels safe while load dumps clear of bank

Safe at all times

In dumping, Tournapull Rear-Dumps are safer than any truck. Front-wheel-drive keeps power and traction on solid footing well ahead of rear wheels. Because body does not need to clear frame, springs, axle, or differential, its center of gravity stays low, even during dump. Oversize multi-disc air brakes — *with more braking surface on one wheel than comparable-size trucks have on all four* — prevent creeping or rolling.



SOFT FOOTING GOOD FOOTING

Separate braking of front and rear wheels can be used with action of hoist to help front wheels pull away from edge of soft dump. In case of trouble, rear brakes are set, front brakes released. When bowl is lowered from normal dumping position, free-rolling prime-mover wheels are pushed forward. On the "C" size Rear-Dump, they move 6½ ft. — usually enough to find good footing. If front drive wheels do not reach good footing after bowl is lowered, same "leap-frog" process can be repeated. Simply pull rear wheels forward by setting front brakes and raising bowl, then set rear brakes and push front wheels ahead by lowering bowl.

Accurate spreads while moving

Tournapull Rear-Dumps can also spread on the run. Bowl can be safely raised and lowered at normal haul speed. Operator simply positions bowl for desired flow of material and continues to drive.

There's a Tournapull Rear-Dump size to fit your needs

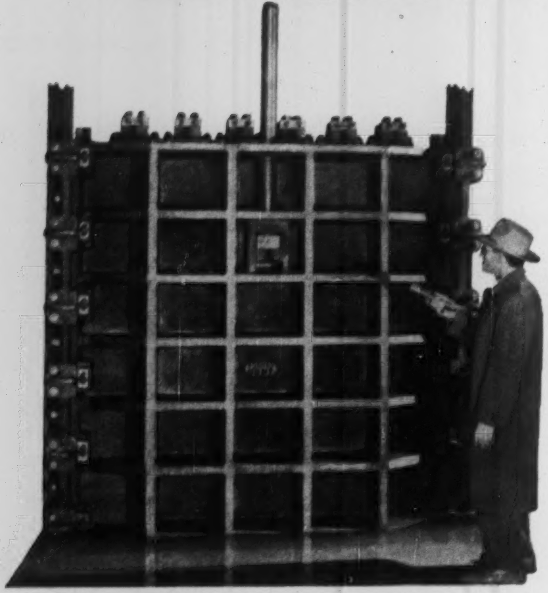
"D"	"C"	"B"
9 TONS	22 TONS	35 TONS
138 HP	208 HP	293 HP

Prime-movers for these Rear-Dumps also power scrapers, bottom-dumps, flatbeds, and cranes.

Tournapull—Trademark Reg. U.S. Pat. Off. R-778-G-b

LeTourneau-WESTINGHOUSE Company
Peoria, Illinois
A Subsidiary of Westinghouse Air Brake Company

FOR GENERATIONS TO COME!



RODNEY HUNT SLUICE GATES

Controlled cast iron from our own modern foundry ... heavy bronze wedges ... generous bronze wedge seats ... seat facings of malleable extruded bronze, pneumatically impacted and work-hardened in machined dovetail grooves of disc and frame ... these are typical of the workmanship which gives Rodney Hunt Sluice Gates their unique value and true economy for generations to come!

Specify Rodney Hunt Sluice Gates for standard sizes of 6 x 6 to 120 x 120 inches clear opening, rectangular or round. Over 2000 combinations of standard Rodney Hunt Sluice Gates, including many of unusual dimensions, are available with precision-built hoists.

Write us for the name and address of the Rodney Hunt representative in your area. He'll be glad to give you quotation information and engineering assistance.

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RODNEY HUNT®

RODNEY HUNT MACHINE CO.
WATER CONTROL EQUIPMENT DIVISION
85 LAKE STREET
ORANGE, MASSACHUSETTS • U. S. A.

employee organization, cannot adequately represent the independent consulting engineers through its proposed Functional Groups. It is estimated that only 3% of NSPE's 36,000 members are consulting engineers.

Membership in the new federation would be open to "state, regional or other local area regularly formed associations, institutes, or similarly constituted groups of independent consulting engineers." Proposed charter members are: Consulting Engineers Association of California; Chicago Association of Consulting Engineers; Colorado Association of Consulting Engineers; Gulf Institute of Consulting Engineers; Intermountain Institute of Consulting Engineers; Minnesota Association of Consulting Engineers; Missouri Association of Consulting Engineers; New York Association of Consulting Engineers; Association of Consulting Engineers of Upstate New York; and Consulting Engineers Association of Oklahoma.

Men and Job Briefs . . .

• **Military**—Corps of Engineers' district engineer at Charleston, S. C., **Col. Clyde C. Zeigler**, will be transferred to duty in France on August 1 . . . **Charles H. Inman, Jr.**, former special assistant to the resident officer in charge of construction at the Guantanamo Naval Base, Cuba, becomes Director of the Construction Division, Public Works Office, Tenth Naval District, San Juan, Puerto Rico.

• **Careers**—The Ohio Board of Building Standards names **Jacob R. Shank,** civil engineering instructor at Ohio State University, as executive secretary . . . **Ralph Kerslake,** formerly state aid engineer in the Seattle district office of the Washington State Highway Department, is appointed district construction engineer at Wenatchee, replacing **Ted Morehouse,** who is going to Guatemala on road work.

• **Business**—Vice chairman of the Raymond Concrete Pile Company, **William V. McMenimen** is elected to the board of Ibec Housing Corporation . . . **David T. Beals III** is appointed vice president and member of the board of directors of the United States Lift Slab Corporation and its foreign subsidiary, International Lift Slab Corporation . . . The Central Railroad Company of New Jersey names **S. L. Mapes** assistant vice president. **B. J. Minetti** succeeds him as chief engineer.

C Tournapulls load a mixture of light sandy silt and gravel from a canal cut and haul ¼ mile to build canal banks.

"Move dirt cheaper than other rigs"...

says Superintendent Bob Smith

In the "Big Bend" country, State of Washington, main canals for the Columbia-River-Basin Irrigation Project are complete. These canals carry water 150 mi. from Grand Coulee Dam to the 1¼-million acre "Basin", where ½ million acres of land are irrigated.

Branches from the main canals are now being built for distribution of water to the remaining ¾ million acres of dry and dusty sage-brush land. The irrigated land, in units of 65 to 110 acres, will be sold to farmers for gardening and grazing at prices from $25 to $85 per acre. This huge project is being constructed for the Bureau of Reclamation, U. S. Dept. of Interior.

Cherf Bros. & Sandkay, Ephrata, Wash., have 5 C Tournapulls helping to build 49 miles of lateral ditches for this project. These laterals are built by the "economic fill" method (see diagram). "C's" build a flat road-like runway, averaging 2′ high, 12′ wide, firmly compacted. Dragline follows, digging ditch in center of "run", piling dirt along each side to increase height of banks. Water level will be maintained about 6″ below top of compacted dirt level. Eventually, ditch will be cement-lined.

"Really move muck"

Describing the performance of C Tournapulls used for building the "run", Roy Johnson, of Cherf Bros. & Sandkay, said, "We like Tournapulls because they get around fast, really move muck! Perfect size for this kind of job." Tournapulls' top travel speed to 30 mph helped on both long and short hauls. Easy maneuverability, electric controls, and big brakes are made for fast handling all through the cycle.

"Move dirt cheaper"

Supt. Robert Smith added: "Tournapulls keep us ahead of schedule, move dirt cheaper than other rigs." Smith especially liked the way operators could use Tournapull's positive electric power-steer to pivot prime-mover from side to side where footing was soft. This permitted "walking" the drive wheels out of tough spots while making fast delivery of big loads to the fill.

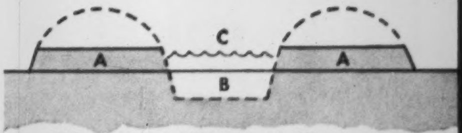
"Differential makes the difference"

According to Tournapull operator Tom Carder, "These 'Pulls are the only outfits that could do this job. Other rigs would get stuck. It's the Tournapull differential that makes the difference." Why not check with Tournapull owners to find out what these handy, high-speed dirtmovers can do for you? Or, ask for a demonstration on your job!

NEW improved 18-yd. heaped capacity Fullpak "C" will give you faster, bigger loads than shown in this job report. New lower, wider bowl packs in load to back corners with live, boiling action, heaps quickly for big, low-void pay-load. Get details now.

Canal-bed built by spreading thin layers of material, compacted by rolling action of the wide rubber tires of C Tournapulls.

One "C", equipped with tank, used full time to haul water to cuts and fill. Continuous watering helped scrapers get bigger loads out of cuts, aided in compaction of material on fill.



"Economic fill material"

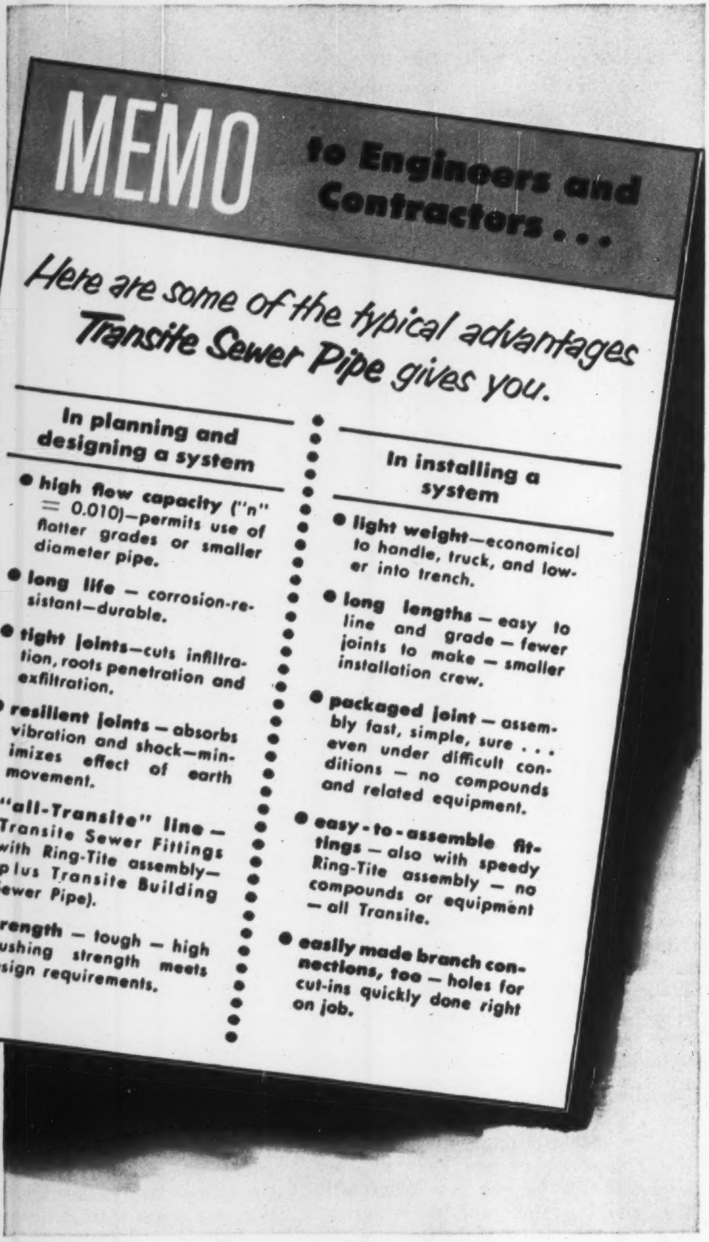
A. Flat, compacted, road-like bed, about 2′ high, 12′ wide, built by Tournapulls.

B. Average 3′ ditch dug by dragline, dirt piled on sides to raise banks.

C. Eventual water-line just below top level of compacted dirt

Tournapull—Trademark Reg. U.S. Pat. Off. P-901-A-b

LeTourneau-WESTINGHOUSE Company
Peoria, Illinois
A Subsidiary of Westinghouse Air Brake Company



MEMO to Engineers and Contractors . . .

Here are some of the typical advantages Transite Sewer Pipe gives you.

In planning and designing a system

- **high flow capacity** ("n" = 0.010)—permits use of flatter grades or smaller diameter pipe.
- **long life** — corrosion-resistant—durable.
- **tight joints**—cuts infiltration, roots penetration and exfiltration.
- **resilient joints** — absorbs vibration and shock—minimizes effect of earth movement.
- **"all-Transite" line** — Transite Sewer Fittings with Ring-Tite assembly—(plus Transite Building Sewer Pipe).
- **strength** — tough — high crushing strength meets design requirements.

In installing a system

- **light weight**—economical to handle, truck, and lower into trench.
- **long lengths** — easy to line and grade — fewer joints to make — smaller installation crew.
- **packaged joint** — assembly fast, simple, sure . . . even under difficult conditions — no compounds and related equipment.
- **easy-to-assemble fittings** — also with speedy Ring-Tite assembly — no compounds or equipment — all Transite.
- **easily made branch connections, too** — holes for cut-ins quickly done right on job.

Select TRANSITE® for more economical, tighter sewerage systems . . .

Whether a new sewerage system is being planned or additions to an existing one are being made . . . engineer and contractor alike will find a combination of qualities in performance-proved Transite Sewer Pipe that will fit their individual needs. They will find this holds true whether the local conditions call for (a) tight joints to protect against root growth and infiltration of ground water or (b) the strength and flow characteristics that mean definite savings in the design stage, during trenching and installation, and in operation as well.

For further information about Transite Sewer Pipe, write for Booklet TR-165A, Johns-Manville, Box 60, New York 16, N.Y.

Johns-Manville TRANSITE SEWER PIPE

with the RING-TITE® Coupling

Obituaries

Mary O. Seroka, 51, first woman civil engineer to be licensed by New York State, died March 7. A graduate of Massachusetts Institute of Technology in 1926, Miss Seroka had been a civilian engineer attached to the Air Force at the Pentagon.

John W. Bowser, 63, who was construction supervisor on the Empire State and the New York Life Insurance Co. buildings in New York City, died March 30. Bowser was said to be the first builder of modern earthquake-proof buildings in Japan.

Howard F. Bell, 71, retired city and county engineer at Cody, Wyoming, died March 23. A civil engineering graduate from Ohio State University in 1909, he also served with the Bureau of Reclamation on construction of several irrigation projects in Wyoming.

Chester R. Clarke, 60, contractor and builder, died March 31 in Honolulu. Among his many business activities, he was advisor on the Manila rehabilitation program, president of the Clarke-Halawa Rock Co. and founder of ready-mixed concrete firms in Hawaii and the Philippines. From 1950 to 1953 Clarke had been engaged in construction work on Okinawa for the Corps of Engineers.

Thomas E. Coultry, Sr., a civil engineer in the U.S. Bureau of Public Roads since 1931, died March 28 in Albany, N. Y. He was a graduate of Rensselaer Polytechnic Institute.

E. A. Drott, 69, who founded Drott Tractor Company, Inc. in 1916 at Butternut, Wis., died April 5. His work on loaders, with their many attachments for logging, earthmoving and material handling has become widely recognized in the construction field.

Frank J. Glueck, 68, who was associated with the R. M. Luff Construction Co., in Willow Grove, Pa., died April 9. A civil engineering graduate of Rensselaer Polytechnic Institute in 1912, he had been an authority in the field of hydraulics, particularly in the design and construction of waterworks and sewage treatment plants.

Ulysses G. Johnson, 70, who retired as a civil engineer for the Philadelphia Highway Department in 1952, died April 8. He was a graduate of the University of Pennsylvania.

Brody Group of Dormitories and Dining Hall, Michigan State University, East Lansing, Mich. Architect: Ralph R. Calder, Detroit, Mich. General Contractor: Christman Co., Lansing, Mich. • Concrete Slab Form Work: The Hausman Steel Company, Toledo, O.

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Construction Reports

Bids Asked—Low Bidders—Contracts Awarded—First Section—

Compiled by Business News Department—Engineering News-Record, 330 W. 42nd St., New York 36, N. Y., ELSIE EAVES, Manager
J. A. MAHONEY, M. WETZEL, L. M. FELIX, M. E. SCIORRA, F. S. DEMBEK, Reports.
J. H. WEBBER, M. R. ROESSLER, E. R. HUBER, Statistics.

NEW ENGLAND

BUILDINGS—LB & CA

▲ **Molony & Rubien Constr. Co.**, 66 Wickenden St., Providence, R. I., LB Est. **$2,500,000.** 216x614 ft. brick SCHOOL, NATIC, R. I. St. **Joseph's School,** Natic, R. I. Bids Mar. 23. CD 3/19.

Schnier & Shlomberg, 18 Raymond Rd., West Hartford, Conn. CA Approx. **$825,000.** 100 HOUSE DEVELOPMENT, Knollwood and Deepwood Rds., NEWINGTON, CONN. Knollwood Estates, 18 Raymond Rd., West Hartford, Conn. Awarded Apr. 9.

MIDDLE ATLANTIC

BUILDINGS—BA

▲ **Md., Baltimore**—DWELLINGS—BA 5/3—Baltimore Housing Auth., 709 E. Eager St., Zone 2, Lexington Terrace, 677 dwelling units, Proj. MD-2-19, $1,500,000. Plans deposit $100. CD 5/21/45.

▲ **N. J., Tenafly**—SCHOOL—BA 5/15—Bd. Educ., 24 County Rd., Senior High School. $2,400,000. Frederic P. Weidersum, 85 W. Hawthorne Ave., Valley Stream, N. Y., archts. Previous bids rejected. CD 3/19, under LB.

BUILDINGS—SLC

▲ **N. Y., New York**—HOSPITAL—Sisters of Misericorde, 531 E. 86 St., soon lets contract hospital, nursing school, shelter and convent, Misericordia Hospital, 233 St. and Bronx Blvd. $7,500,000. York & Sawyer, 101 Park Ave., archts. CD 1/31/55.

HEAVY CONSTRUCTION—LB & CA

▲ **NEW YORK**—John W. Johnson, state supt., P. Wks. Dpt., The Gov. Alfred E. Smith State Office Bldg., Albany,

N. Y.—**Serafini Construction Co., Inc.,** RD #1, Conklin Rd., P.O. Box 265, Binghamton, N. Y., LB **$1,389,363,** est. $1,803,000 (5 bidders) constr. 10.84 mi. sect. of Whitney Point-Greene Rd. which on Completion will become part of State Rte. 206, Broome and Chenango Counties.

N. Y.—**Kendall Roadways, Inc.,** 1373 Williams St., Buffalo 21, N. Y. LB **$674,513.** Est $723,000. (2 bidders) constr. 3.21 mi. sect. of Olean's north-south arterial route starting on South Union St. (Rte. 16A) near city line and exten. southward, Cattaraugus Co.

N. Y.—**Horn Construction Co., Inc.,** 2174 Hewlett Ave., Merrick, L. I., N. Y. LB **$2,896,724.** Est. $2,930,000. (2 bidders) constr. 0.82 mi. sect. of Brooklyn-Queens Expressway between Division Ave. and Lorimer St., Kings Co.

N. Y.—**Frank Mascali & Sons, Inc.,** 120th St. & 31st Ave., Flushing, N. Y. LB **$2,879,329.** Est. $2,894,000 (1 bidder) constr. 0.46 mi. sect. of Brooklyn-Queens Expressway and 1.03 mi. of access roads between Bedford Ave. and Division Ave., Kings Co.

N. Y.—**Lizza & Sons, Inc.,** 21-23 Orchard St., Oyster Bay, N. Y. LB **$4,696,982.** Est. $5,812,000 (5 bidders) constr. 3.32 mi. sect. of six-lane divided Horace Harding Expressway Extension and 5.86 mi. of access roads between New York City Line and Shelter Rock Rd., Nassau Co.

N. Y.—**Lane Construction Corp.,** 965 East Main St., Meriden, Conn., LB **$2,112,925.** Est. $2,912,000. (6 bidders) paving previously graded 8.39 mi sect. of new Rte. 17 from Lords Reservoir about 6 mi. west of Wurtsboro generally southeastward around Wurtsboro to top of the Mountain ridge just west of Bloomingburg and constr. of 1.54 mi. of access roads, Sullivan Co.

N. Y.—**County Asphalt, Inc.,** 129 Main St., Tarrytown, N. Y., LB **$1,435,757.** Est. $1,438,000. (1 bidder) reconstr. 7.66 mi. Rte. 17B starting west of Barryville Rte. 55 connection and extending eastward to Rte. 17 intersection west of Monticello, Sullivan County.

N. Y.—**County Asphalt Inc.,** 129 Main St., Tarrytown, N. Y. LB **$856,159.** Est. $955,000. (5 bidders) reconstr. 4.49 mi. sect. of Rte. 96 between Spencer and Candor, Tioga Co.

N. Y.—**Bero Construction Corp.,** 259 Delaware Ave., Buffalo, N. Y. LB **$816,754.** Est. $864,000. (5 bidders) reconstr. 7.23 mi. sect. of Rte. 31 between Pittsford and Palmyra incl. repairs to Barge Canal Bridge, Monroe Co.

N. Y.—**Thomas P. Spagnoletti Construction Co., Inc.,** 14 Denton Rd., Binghamton, N. Y., LB **$221,302,** est. $260,000 (15 bidders) reconstr. Stockbridge Falls-Merrillsville Co. Rd. starting near Siloam and exten. northwestward 2.43 mi., Madison Co.

NEW YORK—Triborough Bridge & Tunnel Auth., Administration Bldg., Randall's Island, New York, Zone 36,

Teller Paving & Contg. Corp., 389 E. 167 St., New York 56, N. Y. CA **$877,365** (6 bidders) Queens-Midtown Expressway Contr. No. QME-9, landscaping marginal recreation and directional signs, Midtown Hy. to Woodhaven Blvd., Queens Co. CD 4/4, under LB.

▲ **Tully & DiNapoli, Inc.,** 127-50 Northern Blvd., Flushing, N. Y. CA **$1,090,000.** imprv. drainage sys. at LaGuardia Airport, JACKSON HEIGHTS, N. Y. Port of New York Auth., 111 Eight Ave., New York 11, N. Y. CD 4/6, under LB.

▲ **Hendrickson Bros., Inc.,** 63 N. Central Ave., Valley Stream, N. Y. LB **$1,464,075.** lateral sewers in Elmont and vicinity, town of Hempstead, Proj. 1002-2-FP-3, MINEOLA, N. Y. County Executive, Nassau Co., Old County Court House, Mineola, N. Y. Bids Apr. 10. CD 10/26.

▲ **NEW JERSEY**—New Jersey State Hy. Auth., Boro Hall, 51 Monmouth St., Red Bank,

Reid Contg., 21 Main St., Woodbridge, N. J. LB **$4,075,075,** structural steel; **$4,072,570,** pre-stressed concrete beam alternates, Garden State Parkway, Contr. 207, Sect. 1A, grading, paving, bridges from Station 605 to New York State Line in Twp. of Washington and Boroughs of Hillsdale, Woodcliff Lake and Montvale, Bergen Co. Bids Mar. 29. CD 3/9.

Villa Contg. Co., Inc., 23 North Ave., Westfield, N. J. CA **$738,526.** 4,400 ft. taxiway, 75 ft. wide, Newark Airport, NEWARK, N. J. The Port of New York Auth., 111 Eighth Ave., New York 11, N. Y. CD 4/13, under LB.

BUILDINGS—LB & CA

▲ **Merrick Haven Homes,** c/o Lane Realty Co., 107-40 Queens Blvd., Forest Hills, N. Y. Owner Builds. **$1,000,000.** 50 HOUSES, MERRICK, N. Y.

▲ **Kent Knolls at Plainview,** c/o Lane Realty Co., 107-40 Queens Blvd., Forest Hills, N. Y. Owner Builds. **$1,000,000.** 56 HOUSES, PLAINVIEW, N. Y.

Siegfried Constr. Co., 6 N. Pearl St., Buffalo, N. Y. LB **$787,720.** general constr. Thomas Jefferson SCHOOL, TONAWANDA, N. Y. Tonawanda School Bd., 80 Clinton St., Tonawanda, N. Y. Bids Mar. 15. CD 2/23.

▲ **Briar Knolls at Westbury,** c/o Lane Realty Co., 107-40 Queens Blvd., Forest Hills, N. Y. Owner Builds. **$1,750,000.** 85 HOUSES, WESTBURY, N. Y.

▲ **Thomas Constr. Co.,** 165 Holden Ave., Paterson, N. J. CA Est. **$1,500,000.** 2 story, brick SCHOOL and CONVENT, HACKENSACK, N. J. Archdiocese of Newark & Parish of Holy Trinity, c/o Fanning & Shaw, archts., 49 Ward St., Paterson, N. J. Ellwood Powers, 972 Broad St., Newark, N. J., consult. engr.

PROJECTS COVERED

By Size

Construction projects here reported cover the United States and Canada, are of these minimum sizes or larger: water supply, earthwork, waterways $44,000; other public works $73,000; industrial buildings $93,000; other buildings $344,000. Also Foreign projects of $100,000 and more in size of interest to American contractors.

By Regions & Classes of Construction

(In order of Listing)

BIDS ASKED
LOW BIDDERS
CONTRACTS AWARDED

New England
Middle Atlantic
South
Middle West
West of Mississippi
Far West

PROPOSED WORK
Water Supply
Sewers, Waste Disposal
Bridges
Streets & Roads
Earthwork, Waterways
Public Buildings
Mass Housing
Commercial Buildings
Industrial Buildings
Unclassified

In These Stages

PROPOSED WORK: Before and including appointment of engineers or architects.
BIDS ASKED: BA (new announcements only). For full calendar, see also preceding issues.

SOON LETS CONTRACT: SLC

LOW BIDDERS: LB On jobs below $500,000 in value all low bidder news will be the final reports published on the projects involved except where award is not made to the low bidder. In this case, a supplementary contract award report will be published.

CONTRACTS AWARDED: CA Except awards to low bidders previously reported in low bidder stage.

CD dates shown are of Construction Daily issue in which last previous report was published.

OWNERS, ENGINEERS, ARCHITECTS, CONTRACTORS are invited to report their new jobs for listing in these reports when they meet or exceed the size minimums shown above. Address these news releases to J. A. Mahoney, REPORTS, ENGINEERING NEWS-RECORD, 330 W. 42 St., New York 36, N. Y.

Symbols and Abbreviations Include:

†	**Federal Government**
▲	**Project of $1,000,000 or over.**
ENR	**Engineering News-Record**
CD	**Construction Daily**

For additional reports see Construction Daily.

▲ **Gottlieb Schneider, Inc.,** 1446 Monocacy St., Bethlehem, Pa. LB **$2,058,600.** general constr., Dieruff JUNIOR HIGH SCHOOL, ALLENTOWN, PA. Allentown School Dist., 31 S. Penn St., Allentown, Pa. Bids Mar. 29. CD 3/14.

▲ **American Bridge Co.,** Ambridge, Pa. CA Total est. **$2,000,000.** structural steel for car REPAIR SHOPS, MEADVILLE, PA. Erie Railroad Co., B. Blowers, ch. engr., Midland Bldg., Cleveland 15, O. CD 11/23.

John S. McQuade, Jr., 1318 Parrish St., Phila., Pa. CA **$750,000.** WITHERSPOON BLDG., alterations to 6, 7 and 11 floors, PHILA., PA. Bd. Christian Educ. of the Presbyterian Church in the U.S.A., c/o George M. Ewing, archt., Western Savings Fund Bldg., Phila., Pa.

▲ **Riggs & Distler Co., Inc.,** 1518 Walnut St., Phila., Pa. CA **$1,000,000.** BANK and OFFICE BLDG., PHILA., PA. Land Title Bldg. Corp., c/o Albert M. Greenfield & Co., 1325 Walnut St., Phila., Pa. CD 2/13.

▲ **Victor R. Beauchamp,** 431 Cedar St. N.W., Wash., D. C. CA **$1,992,299.** CATHOLIC HOME for AGED, 19 and Eastern Ave., AVONDALE, MD. Archdiocese of Washington, 619 10 St. N.W., Wash., D. C. CD 4/11, under LB.

SOUTH

HEAVY CONSTRUCTION—LB & CA

▲† **Williams-McWilliams Industries, Inc.,** 903 S. Jefferson Dr. Parkway, New Orleans, La. CA **$1,095,192.** Whiskey Bay Pilot Channel enlargement, dredging bottom and sides of Atchafalaya River, St. Martin and Iberville Parishes, Inv. 56-203, LOUISIANA. U. S. Eng., foot of Prytania St., New Orleans, La. CD 4/6, under LB.

▲ **Harrison Constr. Co.,** Alcoa, Tenn., LB **$1,201,461.** (7 bidders) Riverfront-Willow Ave. Redevelopment Proj. Div. "A", Flood Control Works and sanitary sewer readjustments, KNOXVILLE, TENN. City, City Hall Park, Knoxville, Tenn. Bids Apr. 11. CD 3/5.

BUILDINGS—LB & CA

▲ **Booth & Flinn Co.,** 1942 Forbes St., Pittsburgh, Pa. CA general constr. for 450,000 kw. Kammer PLANT to serve Olin Mathieson Aluminum plant at Clarington, O. Total est. **$60,000,000,** MOUNDSVILLE, W. VA. Cresap Operating Corp., 460 Park Ave., New York, N. Y., CD 1/24;
General Electric Co., 1 River Rd., Schenectady, N. Y., CA, two 225,000 kilowatt turbo-generator units (Moundsville, W. Va.);
Babcock & Wilcox Co., 161 E. 42 St., New York 17, N. Y., CA boilers (Moundsville, W. Va.).

Bd. P. Instruction of Duval Co., Jacksonville, Fla. rejected bids Mar. 1, SCHOOL "C", No. 155, 45 and Oxford Sts., JACKSONVILLE, FLA. LB **$737,300.** A. Eugene Cellar, 502 Riverside Ave., Jacksonville, Fla., archt. New bids Apr. 19. Plans deposit $60. CD 3/21, under LB.

▲ **George A. Caldwell,** Box 477, Baton Rouge, La. CA **$1,603,253.** 5 story, bsmnt., State LIBRARY, BATON ROUGE, LA. State Bldg. Auth., State Capitol, Baton Rouge, La. CD 3/13, under LB.

▲ **J. A. Jones Constr. Co.,** 354 Aero Dr., Shreveport, La. CA **$3,717,400.** George Washington Carver JUNIOR-SENIOR HIGH SCHOOL, NEW ORLEANS, LA. Orleans Parish School Bd., 703 Carondelet St., New Orleans, La. Bids Mar. 21. CD 2/28.

▲ **D. R. Selley & Co.,** 409 4th Ave. S., Nashville, Tenn., LB **$1,100,000,** est. $900,000. two DORMITORIES at A & I State University, NASHVILLE, TENN. State of Tenn., State Capitol, Nashville, Tenn. CD 11/16.

MIDDLE WEST

HEAVY CONSTRUCTION—BA

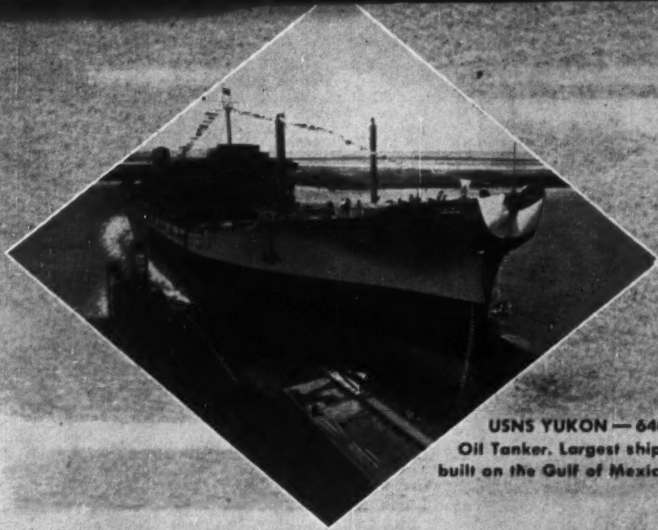
▲† **O., Dayton**—ATOMIC PROJECT—BA 6/14—U. S. Eng., P. O. Box 59, Louisville, Ky., atomic project (A) engine test reactor bldg., 80 ft. diam. steel shell 83 ft. high, 2 story 113x138 ft. operations wing adjoining rein.-con., structural steel; (B) high level radiation bldg., 142x181x27 ft., structural steel, rein.-con. constr. (C) nuclear engineering laboratory 2 story, 57x160 ft., structural steel, rein.-con. (D) 97x109 ft. waste and storage treatment plant, structural steel and rein.-con., connected to high level radiation bldg. by concrete tunnel. (E) 12x30 ft. guard house, Wright Patterson Air Force Base, Est. $6,000,000. The Ralph M. Parsons Co., 617 S. Olive St., Los Angeles, Calif. engr. CD 11/3.

BUILDINGS—BA

▲ **Mich., Grayling**—HOSPITAL—BA 5/2—Sisters of Mercy, Mother Mary Nichols, Provincial House, Sisters of Mercy, 8200 W. Outer Dr., Detroit, Zone 19, Mercy Hospital. $1,000,000. Plans deposit $25, refundable, Gordon Cornwell, Anderson Bldg., Traverse City, archt. E. Roger Hewitt, 1110 S. Pennsylvania Ave., Lansing, engr. CD 12/11/52.

Mich., Ann Arbor—PARKING STRUCTURE—BA 5/8—Regents University of Michigan, W. K. Pierpont,

(Continued on page 84)



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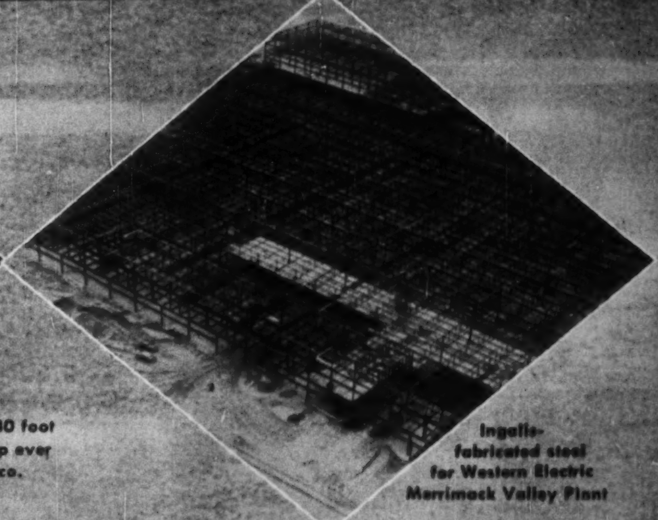

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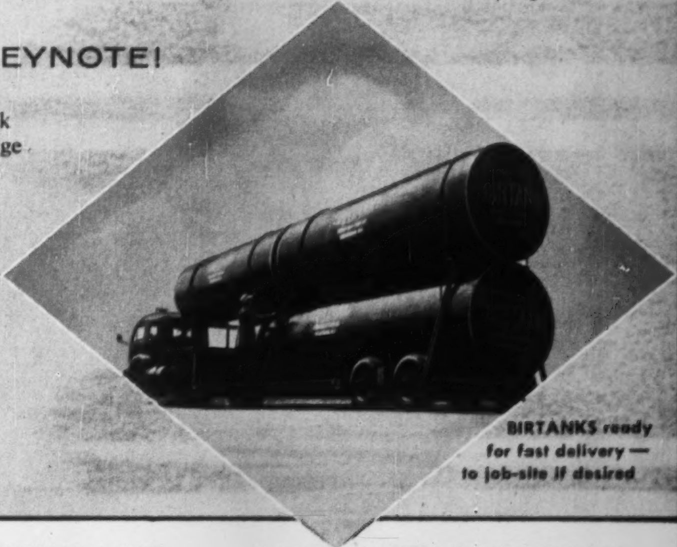

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(Continued from page 82)

vice pres., Service Bldg., Proj. No. 90, 4 story, rein.-con., masonry parking structure, Church St. $800,000. Plans deposit $50, refundable. O'Dell, Hewlett & Luckenbach, 950 N. Hunter Blvd., Birmingham, archts.

BUILDINGS—SLC

▲ Ill., **Skokie**—FACTORY, etc.—Croname Corp., 3625 N. Ravenswood Ave., Chicago, soon lets contract 1 story, 350,000 sq. ft. steel, brick factory and office, Touhy Ave. near Carpenter St. $6,000,000. Graham, Anderson, Probst & White, 80 E. Jackson Blvd., Chicago, Zone 4, archts. CD 7/22/54.

Wis., **Stevens Point**—HIGH SCHOOL—Sisters of St. Joseph Academy, Stevens Point, soon lets contract 2 story L shaped 192x284 ft., concrete, steel, brick, stone Maria High School. $700,000. R. Hackner, 412 Rivoli Bldg., LaCrosse, archt. CD 1/20.

HEAVY CONSTRUCTION—LB & CA

▲ **MICHIGAN**—State Hy. Dpt., Stevens T. Mason Bldg., Lansing,

Mich.—**Sargent Constr. Co.**, 2840 Bay Rd., Saginaw, Mich. CA **$1,053,279**, est. $1,140,000. 8 in. concrete dual pavement 4.919 mi. M-21 from US-13 east to Moorish Rd., F 25-27 C6-R (F 54 6), Genesee Co.;

Mich.—**Hertel-Deyo Co.**, 5205 Division St., Grand Rapids, Mich. CA **$999,245**, est. $1,120,000. c. conc. 4.033 mi. US-31 44 ft. wide with curb and gutter part dual pavement with 4 ft. separation from Traverse City to 4 Mile Rd., F 28-1 C3-U, F 28-1 C4-R, (F 18 7), Grand Traverse Co. CD 3/30, under LB.

BUILDINGS—LB & CA

Hannan Constr. Co., 2605 Edgewood Rd., Cleveland 21, O. Own Forces. **$925,000.** 37 HOMES, N. Sedgwick Rd. LYNDHURST, O. CD 11/30.

Mavec & Co., 26101 Euclid Ave., Cleveland 17, O. Own Forces **$787,500** 35 ranch and colonial HOMES, Swetland Blvd., RICHMOND HEIGHTS, O. Matzinger & Grosel, The Arcade, Cleveland 14, O., archts. Awarded Mar. 26.

▲ **Mercury Builders, Inc.**, 5412 W. North Ave., Chicago, Ill., CA **$2,435,771,** **(a)** HIGH SCHOOL addn., swimming pool and gymnasium. **(b)** HIGH SCHOOL addn., macad. paving, CALUMET CITY and LANSING, ILL. School Dist. 215, Superior Ave. and Pulaski Rd., Calumet City, Ill. Bids Mar. 29. CD 4/11, under LB.

▲ **S. N. Nielsen Co.**, 3059 W. Augusta St., Chicago, Ill., LB **$4,939,000.** Stateway Gardens, 2nd Sect., two 17 story APARTMENTS, 37th and State Sts., CHICAGO, ILL. Chicago Housing Auth., 608 S. Dearborn St., Chicago, Ill. CD 7/9/54.

▲ **Coath & Goss, Inc.**, 5103 W. Lake St., Chicago 44, Ill., CA **$2,377,715,** HIGH SCHOOL addn., EVANSTON, ILL. Evanston Twp. High School, 1600 Dodge St., Evanston, Ill. Bids Mar. 29. CD 2/21.

▲ **T. S. Willis**, 20 E. Milwaukee St., Janesville, Wis. CA Est. **$3,000,000.** general constr. Central Catholic HIGH SCHOOL, KENOSHA, WIS. Regional Diocesan High School, 2000 W. Wisconsin Ave., Milwaukee, Wis. Bids Feb. 28. CD 1/31.

Miller-Davis Co., 1029 Portage St., Kalamazoo, Mich. CA **$700,000.** general constr. TRADE CENTER, Ferris Institute, BIG RAPIDS, MICH. State, A. N. Langius, dir. State Bldg. Dpt., Lewis Cass Bldg., 300 S. Walnut St., Lansing, Mich. CD 3/30, under LB.

▲ **Sullivan-Smith, Inc.**, 22963 Outer Dr., Dearborn, Mich. Owner Builds. **$6,000,000.** Warren Valley Development 400 brick HOMES, Golf View Manor Warren and Middle Rouge Parkway, DEARBORN, MICH.

▲ **Holtzman & Silverman**, 2120 National Bank Bldg., Detroit 26, Mich. Owner Builds. **$3,500,000.** Bonnie Brook Development, 240 brick HOMES, 8 Mile and Telegraph Rds., DETROIT, MICH.

Alfred A. Smith, Inc., 721 E. Saratoga St., Ferndale, Mich. CA **$815,158.** general constr., 281x283 ft., L-shaped THERAPY UNIT, Northville State Hospital, NORTHVILLE, MICH. State, A. N. Langius, dir. State Bldg., Dpt., Lewis Cass Bldg., Lansing, Mich. CD 3/13, under LB.

▲ **Nelson Homes, Inc.**, 17128 Wyoming St., Detroit 21, Mich. Owner Builds. **$1,700,000.** Warren 87 Sub-Division, 100 brick HOMES, 11 Mile and Lorraine Rds. between Van Dyke and Hoover, WARREN, MICH.

WEST OF MISSISSIPPI

HEAVY CONSTRUCTION—LB & CA

▲ **IOWA**—State Hy. Comn., Ames,

Iowa—**Booth & Olson, Inc.**, 529 Insurance Exchange Bldg., Sioux City, Iowa. CA **$1,049,078.** b. conc. 11.54 mi., F-773 (3), Pottawattamie Co.

Iowa—**Stade Constr. Co.**, Fairmont, Minn. CA **$604,644.** b. conc. 11.111 mi., F 767 (4), Mills and Pottawattamie Counties. CD 4/10, under LB.

▲ **TEXAS**—Texas Turnpike Auth., 214 First Federal Savings Bldg., Austin, Zone 1,

Tecon Paving Co., 1201 Main St., Dallas, Tex. CA **$2,131,700.** Proj. No. D-FW-42, grading, drainage 3.707 mi. Chalk Hill Rd. to Sylvan Ave., Dallas Co. Bids Mar. 27. CD 4/3, under LB

NEW MEXICO—State Hy. Dpt., Capitol Bldg., Santa Fe,

Skousen-Hise Contg. Co., Springer Bldg., Albuquerque, N. M. LB **$991,195.** (3 bidders) Santa Fe-Rio Arriba Co.-line-south, Proj. F 051-1 (4), Santa Fe Co. Bids Apr. 6. CD 3/30.

(Continued on page 86)

Brand New!

SUPERIOR

Speed-Strip

PAT. APPLIED FOR

A METAL CHAMFER STRIP THAT PRODUCES NEATER, CLEANER CORNERS AT LESS COST

RE-USABLE
REDUCES LABOR TIME
CUTS & BUTTS TO ANY LENGTH
EASY TO HANDLE
STURDY GALVANIZED STEEL

For better chamfers in concrete construction at less cost, investigate the important advantages of Superior Speed-Strip. Remember — there's only one material cost . . . labor is reduced substantially . . . pays for itself in a few re-uses!

Built for rough contractor usage, Speed-Strip is:

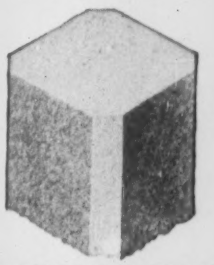
(a) Easy to handle and quickly nailed to edge of form lumber, plywood, or S4S.

(b) Reduces damage to forms because of minimum nailing and stripping. As Speed-Strip stays on the form during stripping, the form with chamfer is always ready for re-use. Therefore, only one application to forms is necessary where jobs duplicate column sizes, spandrel beams, pilasters, etc. Where jobs are not typical sizes, Superior Speed-Strip is easily detached from form boards, then cut and butted to desired lengths for many re-uses.

(c) Reduces time loss in finishing—produces smooth neat corners.

Comes in 8 ft. stock lengths which may be cut or butted to any length. Made of 24 ga. galvanized steel with 1⅛" face for concrete contact. Write for sample.

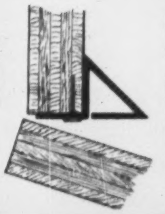
MINIMUM NAILING AND MINIMUM WRECKING



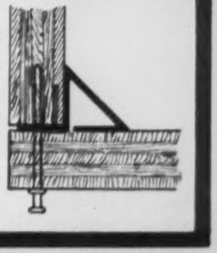
SMOOTH, NEAT CORNERS
Always a uniform size and shape chamfer

HERE'S HOW Speed-Strip WORKS

Tack Speed-Strip through indentations on to edge of form board with lath type nail.



Place companion form board in position as conventionally done. Drive double-headed nail through.



SUPERIOR CONCRETE ACCESSORIES, INC.

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It prints and develops in one continuous operation at speeds up to 40 feet per minute . . . easily handles roll or cut stock as wide as 42 inches. Easy-to-reach controls command quick response throughout the machine's entire operation. Developing and printing sections are automatically synchronized for simplest operation at any speed.

Complete diffusion of vapors through exclusive "jet-nozzle feed" insures uniform, dry, fully developed prints. Spacious receiving trays automatically stack prints in sequence. Electrically welded one-piece assembly stands 61" high, 61" wide, 42" deep (including feedboard).

See and try the Printmaster 810 yourself. Call your nearest Ozalid distributor for a demonstration. His number's in the phone book, or write Ozalid, Dept. N-4, Johnson City, N. Y., for descriptive brochure.

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LOOK FOR IT!

Got A Printmaking Problem? Call your local Ozalid representative. His expert advice is yours for the asking—whether or not you now own or plan to buy Ozalid equipment.

(Continued from page 84)

BUILDINGS—LB & CA

▲ **Viking Constr. Corp.**, 5948 Pleasant Ave., Minneapolis, Minn. LB **$1,537,850.** (7 bidders) general constr. 5 story, bsmnt., 75x240 ft. PUBLIC HEALTH BLDG., Fourth St. and Third Ave. S., MINNEAPOLIS, MINN. City, G. R. Arneson, city purch. agt., 301 City Hall, Minneapolis, Minn. Bids Apr. 10. CD 3/14.

Ringland-Johnson Constr. Co., Clinton, Iowa, CA Total est. **$750,000.** general constr. 2 story 100x120 ft., brick, glass, steel Research LABORATORY, CLINTON, IOWA. Clinton Foods, Inc., Clinton, Iowa.

▲ **International Paper Co.**, 220 E. 42 St., New York 17, N. Y. Own Forces. **$57,000,000.** newsprint and bleached kraft board MILL, near PINE BLUFF, ARK.

▲ **Manhattan Constr. Co.**, Mid-States Bldg., Tulsa, Okla. LB **$1,426,797**, est. $1,375,000, Alexander Hamilton JUNIOR HIGH SCHOOL, TULSA, OKLA. Independent School Dist. No. 1, Tulsa, Okla. Hugh R. Humphrey, McFarlin Bldg., Tulsa, Okla., archt. CD 6/8.

▲ **B. L. McGee Constr. Co.**, Box 782, Austin, Tex. CA **$1,788,000**, est. $800,000. RECEIVING and INTENSIVE TREATMENT BLDGS. for men and women for Austin State School, AUSTIN, TEX. Bd. for Texas Hospitals & Special Schools, 4405 Lamar Blvd., Austin, Tex. Bids Mar. 22. CD 3/27, under LB.

Beall Constr. Co., 2802 Louisiana St., Houston, Tex. CA **$785,550**, SHOPPING CENTER expansion, HOUSTON, TEX. Woodlawn Acres Shopping Center, c/o Miles Strickland, 2802 Louisiana St., Houston, Tex. CD 3/23.

Haggerty-Messmer Co., Bozeman, Mont. CA **$882,992.** general constr. HEALTH AND PHYSICAL EDUCATION BLDG. State College, BOZEMAN, MONT. State College of Educ., Bozeman, Mont. Bids Mar. 27, CD 2/28;
Midland Plumbing & Heating Co., Billings, Mont. CA **$366,720**. mechanical work (Bozeman, Mont.).

FAR WEST

HEAVY CONSTRUCTION—LB & CA

UTAH—State Road Comn., State Capitol, Salt Lake City, **James Reed**, Lark, Utah, CA **$653,759**, 3½ in. bit. surf. plant mix 4.306 mi. and two concrete bridges, FAP No. F-79 (8) and FI-79 (7), Washington Co. Bids Mar. 20. CD 3/28, under LB.

▲ **WASHINGTON**—State Hy. Comn., Olympia,
Wash.—**Peter Kiewit Sons' Co.**, Box 531 Vancouver, Wash., CA **$522,731**, light bit. surf., c. conc. and b. conc. paving 3.523 mi. Primary St. Hy. 3, Dry Creek to Steptoe, Whitman Co.;
Wash.—**McAtee & Heathe, Inc.**, Box 4187, Station B, Spokane and **F. R. Hewett**, Box 36, Parkwater Station, Spokane, Wash., CA **$705,019**, surf., cement-treated base, b. conc. paving, install lighting sys. 5.109 mi. Primary St. Hy. 2, Custer St. to Pines Rd., Spokane Co. Bids Apr. 3. CD 4/10, under LB.

▲† **S. Morgan Smith Co.**, 500 Lincoln St., York, Pa. LB **$4,258,430** (4 bidders) three 143,000 h.p. hydraulic turbines for Ice Harbor Dam, Pasco, Walla Walla Co., Inv. 56-50, WASHINGTON. U. S. Eng., City-County Airport, Walla Walla, Wash. Bids Apr. 12. CD 3/26.

▲† **Connolly Pacific Co., & T. E. Connolly, Inc.**, 1925 Water St., Long Beach, Calif. CA **$4,928,500**, est. $5,000,000. reconstr. North and South Breakwater at Redondo Beach Harbor, Los Angeles Co., CIVENG-04-243-56-43, CALIFORNIA. U. S. Eng., 75 S. Figueroa St., Los Angeles, Calif. CD 4/2, under LB.

▲ **Baker-Anderson Co. & Ukropina-Polich-Kral**, (joint venture), 201 E. Las Tunas Dr., San Gabriel, Calif. LB **$4,505,173.** constr. Middle Feeder pipe line from LaVerne to Baldwin Park of Colorado River Aqueduct System, LOS ANGELES, CALIF. Metropolitan Water District of Southern Calif., 306 W. 3 St., Los Angeles, Calif. Bids Apr. 5. CD 3/26.

Zarubica Co., 1350 N. Highland Ave., Los Angeles 28, Calif. CA **$743,969**, est. $726,447, Schedule 1A, 25,384 lin. ft. rein.-con. pipe line, Pleasant Valley Pipe line and Reservoir, VENTURA, CALIF. United Water Conservation Dist., Ventura Co., 806 Railroad Rd., Santa Paula, Calif., CD 4/8/49;
Penn Constr. Co., 3932 N. Depot Ave., P. O. Box 276, Baldwin Park, Calif. CA **$69,151**. Schedule No. 2, 75 acre ft. capacity earth fill reservoir. (Ventura, Calif.).

BUILDINGS—LB & CA

▲ **Barrett Constr. Co.**, Evans Ave. and Rankin St., San Francisco, Calif. CA Est. **$3,000,000**, incl. equip. corrugating PLANT, ANTIOCH, CALIF. Fibreboard Products, Inc., Antioch, Calif. CD 2/2.

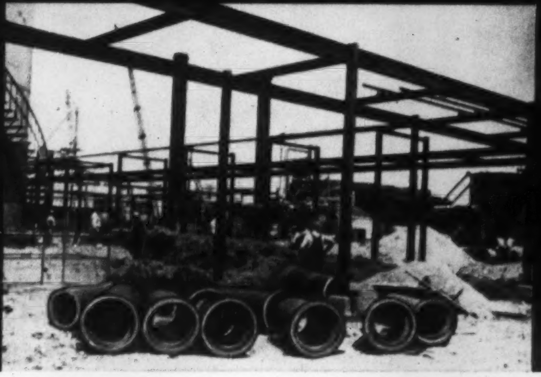
▲ **Oddstad Homes**, 727 Shasta St., Redwood City, Calif. Owner Builds. **$6,240,000**. 520 HOMES at Linda Mar Sub-Division, PEDRO VALLEY, CALIF.

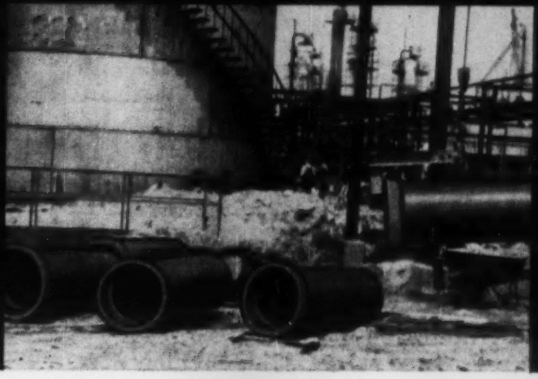
▲ **Carl N. Swenson Co.**, P. O. Box 558, San Jose, Calif. LB **$1,376,000**. (6 bidders) constr. bldgs. for MANUFACTURING FACILITIES, EDUCATIONAL FACILITIES, DESIGN LAB., DEVELOPMENT LABORATORY, 400,000 sq. ft. constr. on 190 acre site, SAN JOSE, CALIF. International Business Machines Corp., 25 Battery St., San Francisco, Calif. CD 1/13.

▲ **William Simpson Constr. Co.**, 2401 Beverly Blvd., Los Angeles, Calif. CA Est. **$1,300,000**. 56,000 sq. ft. ENGINEERING BLDG., 55,000 sq. ft. RESEARCH CENTER, SANTA BARBARA, CALIF. Aerophysics Development Corp., 1580 E. Grand Blvd., Detroit, Mich. Howell, Arendt Mosher Grant, 116 E. Sola St., Santa Barbara, Calif., archts. Thomas Durfee, 701

(Continued on page 89)

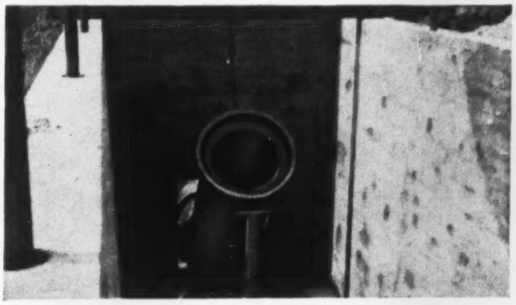
CLAY PIPE *SOLVES* Acid Handling Problems at New Petro-Chemical Plant





THE STANDARD OIL CO. (OHIO) installed several thousand feet of Vitrified Clay Pipe to handle acid wastes in its new $17 million petro-chemical plant at Lima, Ohio. The plant produces anhydrous ammonia, urea, nitrogen solutions, and nitric acid.

NITRIC ACID TANK on the left discharges into the 18-inch Clay Pipe line shown being installed. Clay Pipe is completely unaffected by corrosive chemicals.



THE SOHIO PLANT has its own sewage treatment facilities. Acid is neutralized in this pit where a Vitrified Clay Pipe overflow line drains off the neutralized waste into a conventional sewerage system.

CLAY PIPE offers a variety of jointing methods and materials to meet every need. For this acid-handling application, engineers specified a special hot-poured joint, with quick-setting and high corrosion resistance characteristics.

Directing the project for Sohio were: *F. J. Sanders, Technical Manager; H. F. West, Chief, General Engineering Division; Ted Jakim, Field Engineer.* Pipe was installed by: *A. G. McKee Co.* Other major contractors on the job included: *M. W. Kellog Co., Chemical & Industrial Co.; Vulcan Copper & Supply Co.*

Vitrified
CLAY
CLAY PIPE NEVER WEARS OUT!
PIPE

NATIONAL CLAY PIPE MANUFACTURERS, INC.
1820 N. Street, N.W., Washington 6, D. C.

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100 N. LaSalle St., Rm. 2100, Chicago 2, Ill.
703 Ninth & Hill Bldg., Los Angeles 15, Calif.
311 High Long Bldg., 5 E. Long St., Columbus 15, Ohio

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Progress in Public Health - Through Clay Pipe Research

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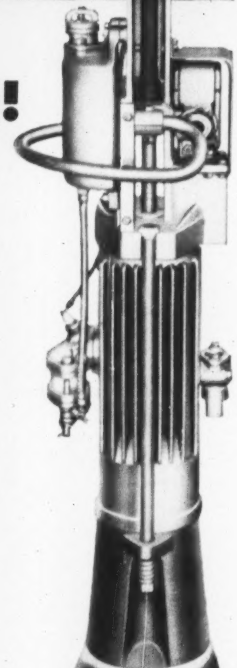
The Key to Better Construction!



NO RECENT TREND in construction has had a more phenomenal growth than the specification of HIGH DEGREE SOIL COMPACTION for all kinds of projects—Atomic Energy, Hydroelectric Power and Flood Control Dams, Highways, Toll Roads and Freeways, Airports, Bridges, Buildings, and Housing Developments! The increase in the use of Barco Rammers on these jobs has been equally great.

Easily meets rigid specifications—
In test after test, Barco Rammers have demonstrated their ability to deliver 95% to 97.5% compaction (modified Proctor Method)—EASILY! EFFICIENTLY! ECONOMICALLY! The Barco Rammer is especially useful for compacting fill in restricted areas—close to walls, culverts, abutments, around footings, and in trenches. ONLY the Barco Rammer can produce specified high degree compaction on lifts up to 20 inches.

Gets jobs finished on time—
One of the biggest advantages offered by Barco Rammers is ability to handle work in minimum time. On area tamping, one man can average 20 to 30 cubic yards of fill per hour. On trench backfill, using lifts up to 24″, the rate for 18″ trench is 360 to 600 feet per hour.

Barco performance pays dividends! We will be glad to arrange a demonstration for you—see our nearest dealer or write.

BARCO MANUFACTURING CO. BARCO **514E Hough Street, Barrington, Illinois**

(Continued from page 86)

E. Main St., Ventura, Calif., mech. and elec. engr. Ropp & Ropp, 2405 W. 3 St., Los Angeles, Calif., mech. engrs.

CANADA

HEAVY CONSTRUCTION—LB & CA

▲ **Pearson Constr. Co. Ltd.**, 1019 Erin St., Winnipeg, Man., CA Total est. **$26,000,000.** (8 bidders), superstructure of steam generating plant. Brandon, MANITOBA. Manitoba Hydro-Electric Bd., 213-219 Notre Dame Ave., Winnipeg, Man. Bids Mar. 21, awarded Mar. 28. CD 3/15.

▲ **Atlas Constr. Co. Ltd.**, 4781 St. Catherine St. W., Montreal, Que., CA Est. **$2,000,000-$3,000,000.** power plant, tail race, intake structure, etc. for power plant at Baie Comeau, QUEBEC. Manicouagan Power Co., c/o North Shore Paper Co. Ltd., Baie Comeau, Que. Bids Mar. 15, awarded Mar. 21. CD 2/28.

BUILDINGS—LB & CA

E. H. Shockley & Son, Ltd., 1936 Powell St., Vancouver, B. C., LB **$985,667.** 100-bed NURSES RESIDENCE, TRAINING CENTER, ESSONDALE, B. C. Dpt. P. Wks., Parliament Bldgs., Victoria, B. C. Bids Apr. 4. CD 3/30.

▲ **Hughes Constr. Co. Ltd.**, 365 Rogers Rd., Toronto, Ont., CA Est. **$1,300,000** (10 bidders) Osgoode Hall LAW SCHOOL addn., incl. two large lecture halls, 2-story library addn., steel frame, brick constr., TORONTO, ONT. Law Society of Upper Canada, Osgoode Hall, Toronto, Ont., and Ontario Dpt. P. Wks., Parliament Bldgs., Toronto, Ont. Bids Mar. 27, awarded Mar. 30. CD 3/15.

▲ **British Thompson-Houston Co. Ltd.**, England, CA **$4,900,000.** electric conversion equip. for smelter at aluminum PLANT, BAIE COMEAU, QUE. Grand total $11,050,000. Canadian British Aluminum Co., Ltd., 1980 Sherbrooke St. W., Montreal, Que., CD 12/6;
English Electric Co., c/o 1411 Crescent St., Montreal, Que., CA **$1,400,000.** electric conversion equip. for smelter (Baie Comeau, Que.);
Komo Constr. Co., Ltd., 1500 St. Vallier St., Quebec City, Que. CA **$1,000,000.** site clearing and access roads (Baie Comeau, Que.);
Sir Robert McAlpine & Sons (Canada), Ltd., 1610 Sherbrooke St. W., Montreal, Que., CA **$3,750,000,** wharf, 8,000 tons steel sheet piling in lengths up to 80 ft. (Baie Comeau, Que.).

▲ **Louis Donolo, Inc.**, 8320 St. Lawrence Blvd., Montreal, Que., CA Approx. **$1,250,000.** 10 story OFFICE and FASHION CENTER, MONTREAL, QUE. Sternthal Realty Co., 1435 St. Alexander St., Montreal, Que. Bids Mar. 5, awarded Mar. 22. CD 3/2.

ALASKA

BUILDINGS—LB & CA

▲† **Raber & Kief**, 420 Queen Anne Ave., Seattle, Wash. CA **$2,698,950,** 61 units FAMILY HOUSING, and direction finder station, Spec. 2404/56, ADAK, ALASKA. P. Wks. Officer, 17th Naval Dist., 215 W. Harrison St., Seattle, Wash. Bids Mar. 28. CD 4/2, under LB.

LATIN AMERICA

BUILDINGS—LB & CA

▲ **Arthur G. McKee & Co.**, 2300 Chester St., Cleveland, O., U.S.A. and **Raymond Concrete Pile Co.**, 140 Cedar St., New York, N. Y., U.S.A. CA Est. **$2,000,000.** altering Belot REFINERY, HAVANA, CUBA. Esso Standard Oil, S. A. (Standard Oil of New Jersey) 15 W. 51 St., **New York, N. Y.,** U.S.A.

PROPOSED PROJECTS

WATER SUPPLY

▲ **Calif., Concord**—Contra Costa County Flood Control & Water Dist., 2400 Oak Grove Rd., defeated bonds Apr. 3, reconstr. water sys. **$9,875,000.** CD 3/2.

▲ **Mich., Midland**—City, Kenneth W. Lybot, clk., voted **$3,000,000** bonds Mar. 20, water system, expansion incl. raw water reservoir, filtered water storage, mains, etc. CD 2/17.

▲ **Va., Fairfax**—Bd. Supervs. Fairfax Co., Court House, voted **$4,500,000** bonds Arp. 5, water sys., incl. dam, pumping station, 24 in. transmission line. CD 3/19.

SEWERS, WASTE DISPOSAL

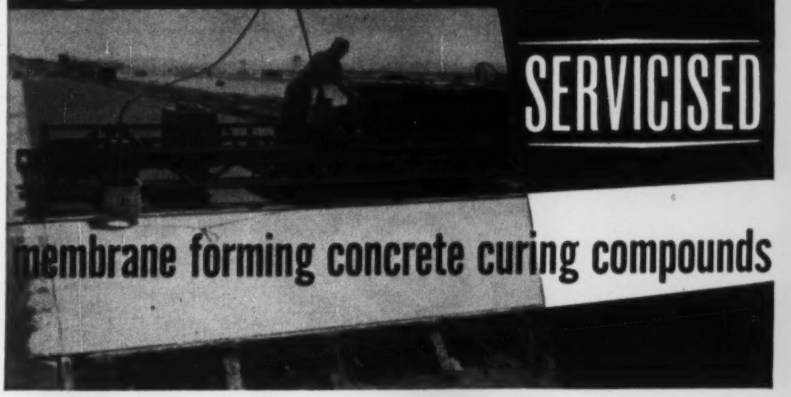
▲ **Pa., Camp Hill**—Lower Allen Twp., Gorgas Community Bldg., sanitary sewerage sys., Lower Allen Twp. **$2,500,000.** Gannett, Fleming, Corddry & Carpenter, 600 N. Second St., Harrisburg, consult. engrs. CD 6/23/53.

BRIDGES

▲ **Conn., Hartford**—Hartford Bridge Auth., 284 Sheldon St., 5 bridges over Connecticut River. **$45,000,000.** Coverdale & Colpitts, 120 Wall St., New York, N. Y., DeLeuw, Cather & Brill, Inc., 202 E. 44 St., New York, N. Y., and Lockwood, Kessler & Bartlett, Inc., 1 Aerial Way, Syosset, N. Y., consult. engrs. CD 3/16.

STREETS AND ROADS

▲ **CONNECTICUT**—State Hy. Dpt., 165 Capitol Ave., Hartford,
Hartford Co.—relocation of Rte. 9, Rocky Hill, Wethersfield and Hartford, **$3,500,000.** Leonard Wegnan &



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4. Save time, labor, material
5. Will not cake in the drum
6. Guaranteed uniform quality and results

WHITE PIGMENTED TYPE Servicised White Pigmented Curing Compound provides a film or membrane capable of reflecting heat. It is widely used in areas where atmospheric temperatures exceed 80°F., and properly applied, will reduce concrete temperatures approximately 15°F. Excessively high temperatures during the early hardening period tend to jeopardize setting of concrete and reduces its final strength. High quality inert pigments added to the basic compound also prevent too thin or uneven coverage, as improper application is readily seen. Used on all U. S. Engineers work.

CLEAR TYPE Servicised Clear Curing Compounds are available in both Wax-Resin and Resin Base Types. Only pure synthetic resins are used with carefully controlled proportions of oils and waxes, etc., in a petroleum solvent to insure a clear, impermeable membrane. Both types can be supplied with a fugitive dye which materially assists in securing proper coverage, and which disappears after application.

WAX-RESIN BASE. A general purpose compound, usually used on mass concrete, pavements. Has excellent water retention properties, allowing slow curing of the concrete which eliminates checking. Dries rapidly and forms a film of uniform texture.

RESIN BASE. Recommended for buildings, offices, architectural concrete, etc. The pure resins, oils and other ingredients present a clear film which does not materially alter the appearance of concrete and it permits early application of adhesives, paint, etc.

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Co., Grand Central Terminal, New York, N. Y., consult. engrs. Bids Oct.-Nov.

reconstr. Rtes. 9 and 187, Bloomfield, East Granby and Simsbury, **$1,600,000.** Goodkind & O'Dea, 39 Lackawanna Place, Bloomfield, N. J., consult. engrs.

EARTHWORK, WATERWAYS

▲ **Connecticut**—Connecticut Light & Power Co., Selden St., Berlin, hydro-electric dam and generating plant in Connecticut River between Windsor Locks and East Windsor, power plant in East Windsor, small set of lock will be provided to let boats through, Hartford Co. **$27,000,000.**

▲ **Washington**—Public Utility District No. 1 of Skamania County, Stevenson, 2,000 ft. earthfill dam, 125 ft. high on Little White Salmon River with two 10,000-kw generators, **$4,000,000.** Work may start this year.

AIRPORTS

▲† **Idaho, Arco**—RUNWAY—U. S. Atomic Energy Comn., Idaho Operations Office, Idaho Falls, runway for testing atomic-powered plane. **$11,400,000.**

PUBLIC BUILDINGS

▲ **Calif., Chino**—SCHOOL—Chino Unified School Dist., Chino, voted **$4,000,000** bonds **Mar. 23,** schools. CD 11/29.

▲ **Calif., Porterville**—SCHOOL—Porterville Union High School Dist., plans by Eddy & Deasy, 2301 H St., Bakersfield, **expand, rehabilitate** Porterville Union High School and Porterville College, **$2,500,000.** CD 1/27.

▲ **Conn., Bristol**—SCHOOL—Town plans by Harold A. Hayden, 175 Main St., high school addn., alteration to present bldg., parking area. **$3,725,000.**

▲ **Conn., Killingly**—SCHOOL—**State P. Wks.** Dpt., 165 Capitol Ave., Hartford, **Northeastern** Vocational Technical School, **$2,200,000.**

▲† **Ga., Dawsonville**—PLANT—Lockheed Aircraft Corp., Marietta, plant for research and development of atomic powered aircraft. **$50,000,000-$100,000,000.** Work may begin in May or June for the Air Force.

▲† **Ill., Great Lakes**—BARRACKS, etc.—Ninth Naval District, Great Lakes Naval Training Center, Great Lakes, plans by Pace Assocs., 53 W. Jackson Blvd., Chicago, 14 barracks bldgs., mess hall, schools, water, sewer and **paving, Great Lakes Naval Training** Center, **$8,413,000.** CD 6/28/51.

▲ **Iowa, Iowa City**—DORMITORIES—Iowa State Bd. Educ., State Office Bldg., Des Moines, plans by Charles Altfillisch, 126½ W. Water St., Decorah, women's dormitory, **$5,000,000;** men's dormitory, **$5,000,000,** at University of Iowa. CD 8/24.

▲ **Mich., Detroit**—JUVENILE DETENTION HOME—Bd. Supervs. Wayne Co., City-County Bldg., **plans** by H. E. Beyster & Assoc., 700 Griswold Bldg., Zone 26, juvenile detention home, Forest, Rivard, Hancock, Riopelle, **$3,200,000.** CD 9/21.

▲ **Mich., Inkster**—SCHOOL—Dearborn Twp. School Dist. 7, Albert D. Bates, pres., 26807 Michigan Ave., voted **$2,200,000** bonds Feb. 28, two elementary schools, Junior High School. CD 2/17.

▲ **Mo., St. Louis**—**GARAGES**—City, Frank J. McDeivtt, pres. Bd. P. Service, 304 City Hall, 12 Blvd. and Market St., Zone 3, 5 story parking garage, block bounded by Broadway, Chestnut, Pine and Sixth Sts., **$2,700,000;** 5½ story, parking garage in block bounded by Eighth and Ninth Sts., Delmar Blvd. and Lucas Ave., **$1,830,000.**

▲ **Mo., Springfield**—SCHOOL—Bd. Educ., Reorganized School Dist. No. 12, James A. Jefferis, pres., 940 N. Jefferson St., voted **$2,750,000** bonds Apr. 3, high school, 3 elementary school addns. to existing bldgs. CD 1/28/54.

▲ **N. J., Blackwood**—SCHOOL—**Black** Horse Pike Regional High School **Bd.** plans by **Hettel & Albert,** Pennsauken, high school, **$2,205,000.** Bond referendum scheduled for Apr. 10. CD 10/7.

N. J., Bloomfield—SCHOOLS—Town plans by Raymond B. Flatt, 36 Broad St., addns. to various schools, **$719,500,** Bids in 3 weeks; elementary school, **$450,000,** Bids in 3 months. CD 11/5/43.

▲ **N. J., Newark**—HEALTH AND WELFARE CENTER—City, City Hall, plans by Ziegler, Childs & Paulsen, 921 Bergen Ave., Jersey City, city health and welfare center, part of new Martland Medical Center, **$4,470,000.**

▲ **N. Y., Bayshore**—SCHOOL—Bd. Educ. plans by Eggers & Higgins, 100 E. 42 St., New York, Zone 17, Junior High School. **$2,000,000.**

▲ **N. Y., Glen Head**—SCHOOL—**Central** School Dist. No. 1, plans by Frederick P. Wiedersum Assoc., 85 W. Hawthorne Ave., Valley Stream, Junior-Senior High School. **$4,000,000.**

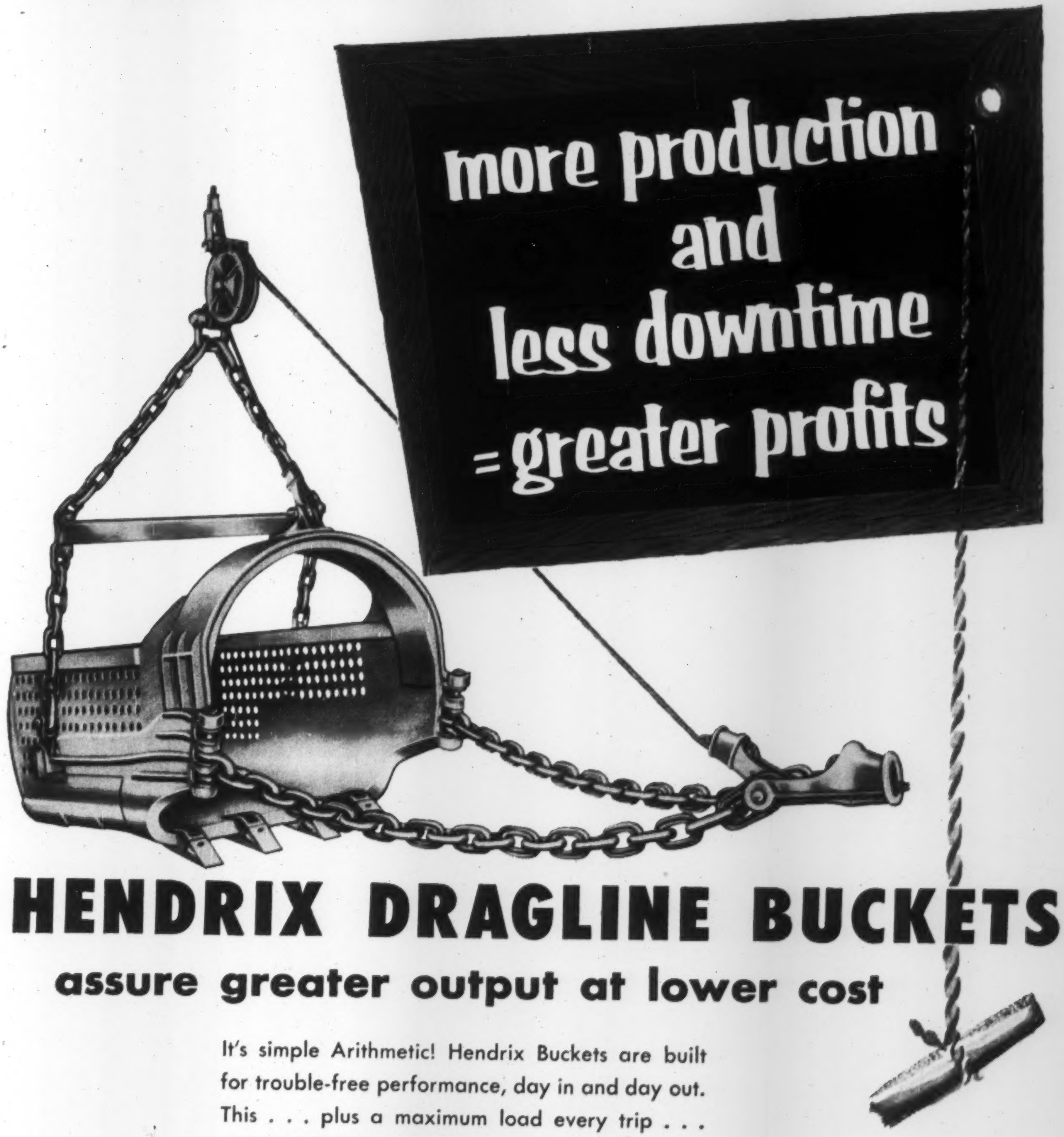
▲ **N. Y., Huntington**—SCHOOL—**Bd.** Educ. plans by Frederick P. Wiedersum Assoc., 85 W. Hawthorne Ave., Valley Stream, high school, McKay Ave. **$2,000,000.** To go ahead in Summer of 1956. CD 12/10/53.

▲ **Pa., Burnham**—SCHOOL—East Mifflin County Joint School Auth. plans by Hunter, Caldwell & Campbell, Altoona, high school, **$2,000,000.**

▲ **Pa., Harrisburg**—OFFICE—State Dpt. Property & Sup**plies, State Capitol, office** in Capitol Park Extension area for State Bureau Motor Vehicles and Highway Safety, **$6,000,000.** CD 5/4/53.

(Continued on page 92)

simple arithmetic . . .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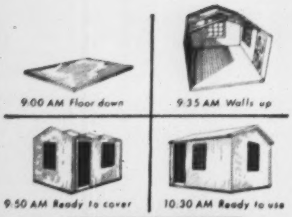

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(Continued from page 90)

▲ **Pa., Phila.**—HOUSING—Phila. Housing Auth., 42 St. 15 St.,

Awbury Proj., 100 units, Maryland St. and Stenton Ave., Mt. Airy Sect., **$1,250,000;**

Belfield Proj., 240 units, Belfield Ave. and Ruscomb St., in Logan Sect., **$3,000,000;**

Champlost Proj., 110 units, 20 St. and Champlost Ave. in West Oak Lane Sect., **$1,375,000;**

Greene Proj., 36 units, Hansberry and Greene Sts., **$450,000;**

Greenway Proj., 100 units, 67 St. and Cobbs Creek Parkway, **$1,250,000;**

Greenwich Proj., 287 units, Fourth and Shunk Sts., **$3,587,500;**

Hartel Proj., 290 units, Hartel St. and Roosevelt Blvd., Rhawnhurst Sect., **$3,625,000;**

Haverford Proj., 28 units, 59 St. and Haverford Ave., **$350,000;**

Johnson Public Housing Proj., 42 units, Johnson St. and Belfield Ave., Germantown Sect., **$525,000;**

Kirkbrides Proj., 231 units, 44 and Market Sts., **$2,887,500;**

Manayunk Proj., 200 units, Manayunk Ave. and Hermit St., **$2,500,000;**

Mantua Proj., 129 units, 38 St., and Mantua Ave., **$1,612,500;**

Mill Creek Homes, 220 units addn., 46 and Aspen Sts., **$2,750,000;**

Norris Homes, 101 units addn., 11 and Norris Sts., **$1,262,500;**

Queen Lane Proj., 20 units, addn., Alfred and Penn Sts., **$350,000;**

Ridge Proj., 70 units, Ridge Ave. and Domino Lane, **$875,000;**

Ripka Proj., 140 units, Manayunk Ave. and Hermitage St., **$1,750,000;**

Ruan Proj., 41 units, Ruan and Leiper Sts., Frankford Sec., **$512,500;**

Tacony Creek Proj., 105 units, Adams Ave. and Crescentville Rd., **$1,312,500;**

Tower Terrace Proj., 107 units, Lyceum and Tower Sts., Manayunk Sect., **$1,337,500;**

Woodhaven Proj., 194 units, Academy and Comly Rds., **$2,425,000.** CD 9/12/49.

▲ **S. D., Sioux Falls**—HIGH SCHOOL—Bd. Educ., 107 High School Bldg., plans by W. J. Dixon, Mitchell, Patrick Henry Junior High School. **$2,000,000.** CD 5/27/55.

▲ **Tex., Bryan**—POWER PLANT—City, addnl. power plant imprvs. and expansion. **$2,000,000.**

▲ **Tex., Fort Worth**—SCHOOLS—Fort Worth Independent School Dist., Ed. P. Williams, bus. mgr., 1300 W. Lancaster St., voted bonds Apr. 7, 23 new schools and addns. to others. **$20,888,000.** CD 3/27.

▲† **Tex., Houston**—FEDERAL OFFICE—General Services Admin., General Services Bldg., Wash. 25, D. C., 12 story federal office, **$9,000,000.** CD 12/5/49.

▲† **Wash., Richland**—PRODUCTION PLANTS, etc.—Atomic Energy Comn., Richland, modify production plants, **$3,000,000;** addnl. waste disposal sys., **$5,000,000;** imprv. reactor cooling water affluent sys., **$550,000,** at Hanford Works. CD 6/30/52.

COMMERCIAL BUILDINGS

▲ **Calif., Beverly Hills**—STORE and OFFICE—Arthur Desser & Harold B. Garfield, c/o archts. plans by Pereia & Luckman, archts., 9220 Sunset Blvd., Los Angeles 46, will do preliminary survey for use of site, 13 story store and office. **$4,000,000.** Expect to start end of 1956.

▲ **Calif., Buena Park**—SHOPPING CENTER—John S. Griffith & Co., 1435 Orland Rd., Los Angeles, shopping center, incl. Sears Roebuck Department Store. **$10,000,000.** Barondon, 8810 Melrose St., Beverly Hills, industrial designers, will make overall plan.

▲ **Calif., Los Angeles**—OFFICE—3540 Wilshire Corp., 3540 Wilshire Blvd., plans by Victor Gruen, 135 S. Doheny Dr., Beverly Hills, 13 story, 200,000 sq. ft. rein.-con. office. **$4,000,000.**

▲ **Conn., Bridgeport**—HOSPITAL—Bridgeport Hospital, Grant St., plans by Charles W. Walker, 114 State St., (2nd unit), 10 story H-shaped hospital, **$6,000,000.**

▲ **Conn., Hamden**—DEPARTMENT STORE—Owner, c/o Henry D. Peters, Dixwell Ave., department store, **$2,000,000.**

▲ **Del., Dover**—HOUSING—P. Wks. Office, Dover Air Force Base, Dover, plans by George E. Pope & Albert Kruse, 911 Washington St., Wilmington, construct and finance 650 housing units, Dover Air Force Base. **$5,000,000.** Bids in May.

▲ **Ind., South Bend**—HOSPITAL—Memorial Hospital of South Bend, 604 N. Main St. plans by Schmidt, Garden & Erikson, 104 S. Michigan St., Chicago 3, Ill., 8 story masonry, structural steel, concrete hospital, alterations in existing bldgs. **$3,300,000.**

▲ **Minn., St. Louis Park**—OFFICE—B. A. Dahlberg, 3916 Colorado Ave. S., plans by Sebco, Inc., 127 Bryant Ave. S., Minneapolis, 15-20 office bldgs., Belt Line and Wayzata Blvd. **$4,500,000.**

▲ **Mo., Grandview**—HOUSING—Purch. & Contg. Office, Grandview Air Force Base, Grandview, plans by Louis H. Geis, 7920 State Line, Kansas City, Mo., construct and finance 700 housing units, Grandview Air Force Base, **$9,100,000.**

▲ **N. J., Keyport**—SHOPPING CENTER—Paul Goldman & Saul Cantor, trading as Hope Homes, 101 Northwood Ave., Linden, plans by Wolf & Glucksman, 850 Broad St., Newark, 150,000 sq. ft. shopping center 25 stores, between Poole and Union Aves., Raritan, adjoining Keyport on Rte. 35 adjoining 500 home development. **$2,500,000.**

(Continued on page 94)

Another Way to HARD-FACE CRUSHER JAWS WITHOUT DISTORTION

A good many operators of crushing equipment consider the hard-facing of jaws a mighty ticklish job; the bugaboo being distortion resulting from welding heat. But H. D. Sutcliffe, maintenance weldor at Buellflat Rock Company in Solvang, California, has a good answer to this problem. Perhaps his method will be applicable to your operations.

Mr. Sutcliffe has a large rack on which he places a number of spare crusher jaws or segments side by side. During the course of the day skip welds are applied from jaw to jaw as time allows, using Stoody Moly-Manganese for rebuilding and Coated Tube Stoodite for the final passes. In this way welding heat is never permitted to build up sufficiently to cause warpage. The Moly-Manganese deposits are peened and wire brushed as they are laid down. By the time the jaws on the rack are finally rebuilt and hard-faced, it is time to remove the worn jaws from the crusher, setting them up for the same rebuilding treatment.

Wear on the crusher is checked at frequent intervals and plates are removed for rebuilding before serious wear occurs. With this procedure it is rarely necessary to buy replacements. The company's experience is that Stoody Moly-Manganese and Coated Tube Stoodite are regularly giving 2 to 3 times the wear of other materials previously used.

Your Stoody dealer (consult the yellow pages of your telephone directory) will be glad to give you descriptive literature on all Stoody alloys, and a copy of the Stoody Guidebook covering maintenance of all types of heavy equipment. Or you may write to the company.

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Whittier, California

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Karnak is an open mesh long-fibre cotton cloth that has been heavily impregnated with highly refined asphalt *so as to leave the mesh open.* It is layered, on the job, with alternate moppings of asphalt to *provide a tough, resilient, waterproof membrane.* The non-sticking fabric unrolls easily . . . to the very end. It "works" faster and with no waste . . . saves labor costs.

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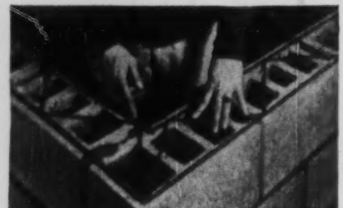

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Sweets
2c/Ced

(Continued from page 92)

▲ **N. J., Red Bank**—HOMES—James Curley, 54-Broad St., plans by Louis J. Farmer, 603 Matison Ave., Asbury Park, 75 homes, to be known as Southview Homes, Inc., on Lincroft Rd., Middletown Twp. **$2,000,000.**

▲ **N. Y., Buffalo**—DORMITORY—University of Buffalo, 3435 Main St., plans by James, Meadows & Howard, 250 Delaware Ave. 11 story dormitory. **$2,300,000.**

▲ **N. Y., North Chili**—COLLEGE BLDGS.—Roberts Weslylan College, North Chili, plans by Clifford Broker Assoc., 18 Rockland Rd., Concord, N. H., 6 college bldgs. **$2,000,000.**

▲ **N. C., Fayetteville** — COLLEGE — Methodist College, Terry Sanford, chn. Bd. Trustees, Fayetteville, 4-year co-educational college, 1 mi. from here, **$3,000,000.**

▲ **O., Fairview Park**—HOMES—Matherson Building Co., 4671 W. 152 St., Cleveland, Zone 11, 110-135 homes Morton Ave., W. 224 and W. 225 Sts. **$3,000,000.**

▲ **Tex., Dallas**—STORES—Sanger Bros., Main and Lamar Sts., plans by Tatum & Quade, 2812 Fairmount St., merchandising store in Preston Area. **$2,250,000;** merchandising store at Intersection Hys. 80 and 67. **$3,000,000.** CD 4/4.

▲ **Ont., Toronto**—OFFICE—Swiss Syndicate, c/o Chartered Trust Ltd., 33 King St. W., plans by L. Forster, 77 York St., 12 story, 107x218 ft. office bldg., 2 bsmnts. and garage for underground parking, rein.-con. constr. air-conditioning, **$8,000,000.** CD 2/27.

▲ **Que., Quebec City** — SHOPPING CENTER — Ivanhoe Corp., 5400 Hochelaga St., Montreal, plans by Eliasoph & Berkowitz, 6931 Cote des Neiges Rd., Montreal, 32 store, shopping center. **$4,000,000.** Bids in June. CD 11/22.

INDUSTRIAL BUILDINGS

▲ **Ala., Pell City**—PLANT—Dixie Pipe & Foundry Co., Pell City, 40,000 sq. ft. PLANT, modernize pipe fittings constr. line. **$2,500,000-$3,000,000.**

▲ **Calif., Anaheim**—PLANT—Cleveland Cap Screw Co., 2917 E. 79 St., Cleveland, Zone 4, O., 250x250 ft., plant. **$2,500,000.**

▲ **Calif., Palo Alto**—PLANT—Varian Associates, Palo Alto, plans by Michael A. Gallis, 414 Mason St., San Francisco, (1st Unit) 2 story, 120,000 sq. ft. vacuum tube plant and 1 story, 65,000 sq. ft. instrument bldg., Bids in 2-3 months; other work, incl. 40,000 sq. ft. administration bldg. and plant addns. **$8,000,000-$10,000,000.**

▲ **Me., Lincoln**—MILL—Eastern Corp., South Brewer, bleached kraft pulpwood mill. **$10,000,000.**

▲ **N. J., Camden**—PLANT—Supplee-Wills-Jones Milk Co., Phila. National Bank Bldg., Phila., Pa., plans by The Ballinger Co., 121 N. Broad St., Phila., Pa., milk processing plant. **$2,000,000.** Bids soon. CD 9/7.

▲ **Pa., Phila.**—FACTORY, etc.—Fayette R. Plumb, Inc., 483 James St., factory and office, **$2,000,000.** Constr. in 1956.

▲ **Tex., Corpus Christi**—REFINERY—Suntide Refining Co., Viola Rd., 15,000 bbl. daily capacity refinery reformer unit, **$10,000,000;** refinery unit for separation aromatics and misc. chemicals, **$1,000,000.**

▲ **Tex., Deer Park**—PLANT—Diamond Alkali Co., Commerce Bldg., Cleveland 14, O. perchlorethylene plant, doubling capacity, **$2,000,000;** storage bldg, **$300,000.**

▲ **Tex., Ennis**—PLANT, etc.—Flintkote Co., c/o Noel D. Speers, pres., Chamber of Commerce, Ennis, and 30 Rockefeller Plaza, New York, N. Y., initial unit of plant, incl. 50,000 sq. ft. warehouse, plant unit for refining asphalt and allied constr. **$1,000,000;** constr. 2nd increment of plant, primarily for mfr. asphalt roofing to consist of felt mill and allied facilities, **$4,000,000, 50-acre tract.**

▲ **Tex., Houston**—PLANT—Celanese Corp. of America, Prudential Bldg., polyolefin resin plant on 220-acre site. Over **$2,000,000.**

▲ **Tex., Houston**—INDUSTRIAL CENTER—Dresser Industries, Inc., 1619 Ovid St., industrial center, 150 acre site Westheimer Rd. **$2,000,000.**

▲ **Wash., Camas**—PULP MILL INSTALLATION—Crown Zellerbach Corp., 343 Sansom St., San Francisco, Calif. install kraft recovery furnace at pulp mill. **$2,000,000.**

▲ **Ont., Toronto**—PLANT—Anaconda American Brass Ltd., 8th and Birmingham St., New Toronto, plant expansion. **$8,000,000-$10,000,000.** W. E. Downer, c/o owner, ch. engr.

UNCLASSIFIED

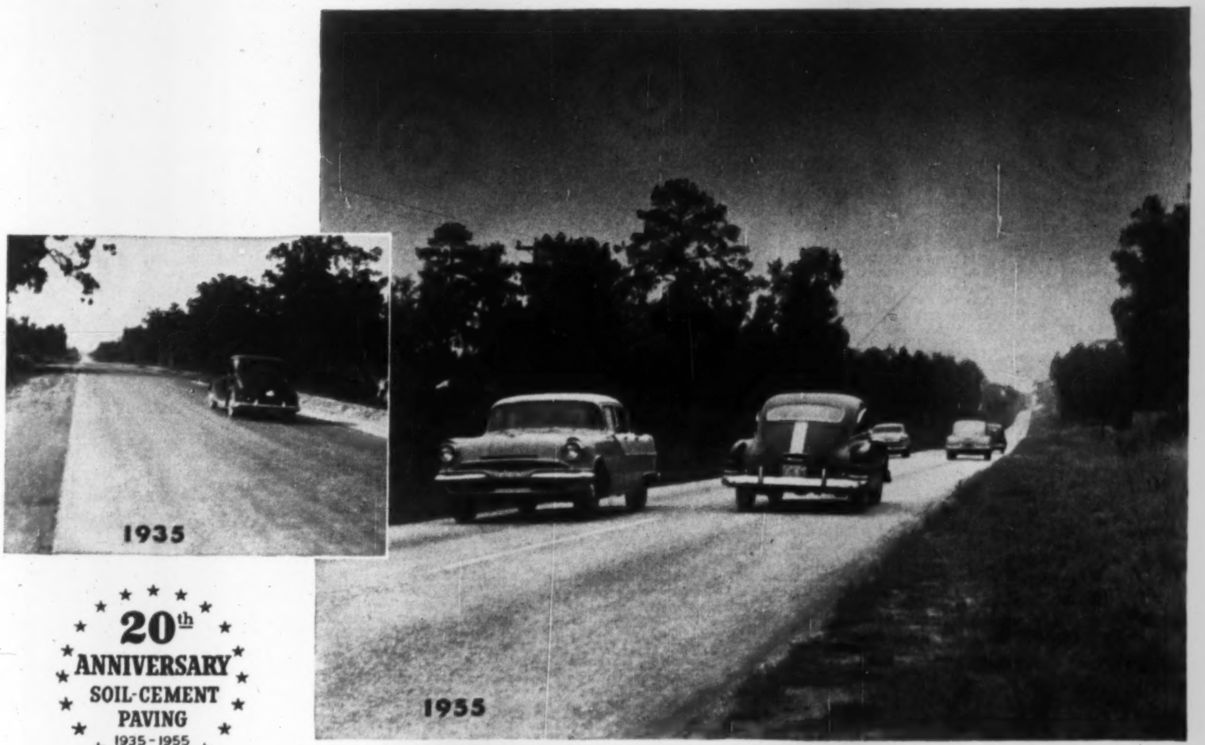
▲† **Colorado**—PARK ROADS—National Park Service, Dpt. Interior, 19 and C Sts. N. W., Wash. 25, D. C., roads and trails, **$3,655,000,** buildings and utilities, **$2,311,000,** Rocky Mountain National Park., "Mission 66", 10-yr. program.

▲† **Colorado**—PARK ROADS—National Park Service, Dpt. Interior, 19 and C Sts. N. W., Wash 25, D. C., roads and trails, **$2,436,000;** buildings and utilities, **$1,666,000,** Mesa Verde National Park, Mission 66, 10 yr. program.

▲† **New Mexico**—SOLAR FURNACE—Dpt. Air Force, The Pentagon, Wash. 25, D. C., solar furnace in Sacramento Mountains, near Holloman Air Development Center, Alamogordo.

▲ **Okla., Tulsa**—FREIGHT YARDS—St. Louis-San Francisco Ry. Co., E. L. Anderson, ch. engr., 309 N. Jefferson St., Springfield, Mo., enlarge freight yards with electric controls in West Tulsa. **$5,000,000.**

▲ **Texas**—GAS LINE—El Paso Natural Gas Co., Bassett Tower, El Paso, 240 mi. gas line from Permian Basin in area of Midland to El Paso. **$18,000,000.** CD 2/5/53.



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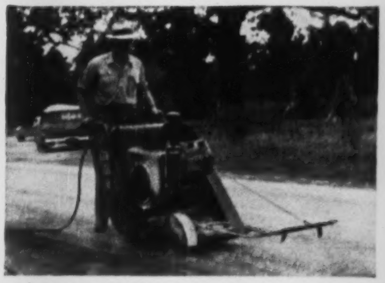

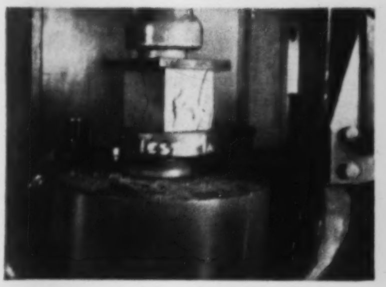

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NEW ENGLAND

HEAVY CONSTRUCTION—BA

STATE HIGHWAY LETTINGS
STREETS AND ROADS
May 1, 8 Massachusetts

BUILDINGS—LB & CA

▲ **Park Constr. Co., Inc.,** 40 Court St., Boston, Mass. LB **$1,998,000,** est. $1,577,000. Ayers SCHOOL, Sylvan St., and Daniels Elementary SCHOOL, 20 Daniels St., MALDEN, MASS. City, 2 Ferry St., Malden, Mass. Bids Apr. 16. CD 3/7.

▲ **E. & F. Constr. Co.,** 94 Wells St., Bridgeport, Conn., CA **$3,614,225,** 6 story HOSPITAL addn., incl. POWER PLANT, laundry, etc., BRIDGEPORT, CONN. Bridgeport Hospital, Grant St., Bridgeport, Conn. Bids Apr. 4, awarded Apr. 13. CD 4/10, under LB.

MIDDLE ATLANTIC

HEAVY CONSTRUCTION—BA

STATE HIGHWAY LETTINGS
BRIDGES
May 1 Maryland, New Jersey
STREETS AND ROADS
May 1 Maryland May 4 Pennsylvania

▲ **N. J., Paterson**—BA 5/8—City, City Hall, third section of sewerage sys., in Hillcrest-Totowa Section. $2,000,000. Bogert & Childs, 624 Madison Ave., New York, N. Y., engrs. CD 10/18/45.

▲† **New York**—AAA FACILITIES—BA On Or About 5/23—U. S. Eng., 111 E. 16 St., New York, Zone 3, A.A.A. facilities, Mill Grove, $1,000,000-$3,000,000, Greenberg & Ames, 303 Fourth Ave., New York, Zone 10, archts. CD 2/18/55.

BUILDINGS—BA

▲ **New York**—HOUSING—BA On Or About 6/26—U. S. Eng., 111 E. 16 St., New York, Zone 3, construct and finance family housing, AAA facilities, in New York area, $1,000,000-$3,000,000, Turano-Gardner, 65 E. 55 St., New York 23, N. Y., archts.

▲ **New York**—HOUSING—BA On Or About 7/31—U. S. Eng., 111 E. 16 St., New York, Zone 3, construct and finance Capehart Housing Proj., in Niagara Area, $1,000,000-$3,000,000; Capehart Housing Proj., AAA facilities, New York area, $1,000,000-$3,000,000, Turano-Gardner, 65 E. 55 St., New York, Zone 22, archts. CD 12/20, under Public Buildings.

▲ **N. Y., Fort Jay**—HOUSING—BA On Or About 7/31—U. S. Eng., 111 E. 16 St., New York, Zone 3, construct and finance Capehart Housing Proj., $1,000,000-$3,000,000. Kelly & Gruzen, 80 Fifth Ave., New York, Zone 3, archts. CD 10/15/52.

HEAVY CONSTRUCTION—LB & CA

▲ **Cauldwell-Wingate Co.,** 101 Park Ave., New York, N. Y. CA **$16,350,000.** 3 story arrival bldg. with two airline wings, International Airport, IDLEWILD, N. Y. Port of New York Auth., 111 Eighth Ave., New York 11, N. Y. CD 2/25/53.

▲ **NEW JERSEY**—N. J. Hy. Auth., 12 Broad St., Red Bank,

Reid Contg. Co., Inc., 21 Main St., Woodbridge, N. J. CA, **$4,072,570,** pre-stressed conc. beam alternate, grading, paving, Contract 207, Section IA, bridges for 5 mi., Garden State Parkway from Station 605 to New York State line in Washington Twp., and Boroughs of Hillsdale, Woodcliff Lake and Montvale, Bergen Co. Bids Mar. 29, awarded Apr. 12. CD 4/13, under LB.

▲ **PENNSYLVANIA**—State Hy. Dpt., 506 N. Office Bldg., Harrisburg,

Pa.—**Brayman Constr. Co.,** 67 N. Harrison Ave., Pittsburgh 2, Pa. CA **$1,718,680.** Schedule 1, substructure of 13 span deck truss and plate girder bridge, divided rein.-con. hy., two I-beam bridges, Rochester, Bridgewater and Beaver Boros, T.R. 51, 68, 88, 18, Beaver Co. Bids Jan. 27, awarded Apr. 17, CD 2/1, under LB;

Pa.—**Pittsburgh-Des Moines Steel Co.,** Neville Island, Pittsburgh 25, Pa. CA **$2,324,736.** Schedule 2, superstructure. (Pennsylvania).

▲† **George F. Hazelwood,** Cumberland, Md. LB **$2,854,253.** (2 bidders) local flood protection, channel imprv., Wills Creek, Sect. 4, constr. Western Rd. railway Bridge No. 1659 and Baltimore St. Hy. Bridge, Cumberland, Md. and Ridgeley, W. Va., MARYLAND and WEST VIRGINA. U. S. Eng., First and Douglas Sts. N. W., Wash. 25, D. C. Bids Apr. 17. CD 3/22.

BUILDINGS—LB & CA

▲ **Bay Terrace Apartments,** Inc., c/o Samuel Paul, archt., 89-51 164 St., Jamaica, N. Y., and Alex Danin, archt., 299 Madison Ave., New York 10, N. Y. Owner Builds. **$2,600,000.** second sect., co-operative garden APARTMENT, 326 units, Bell Blvd. and Cross Isle and Parkway, BAYSIDE, N. Y.

▲ **Chappaqua Hills Homes,** c/o Samuel A. Paul, archt., 89-51 164 St., Jamaica, N. Y. Owner Builds. **$3,300,000.** 100 HOUSES on 30 acre tract in Douglas Rd. west of Hartscrable Rd., CHAPPAQUA, N. Y.

▲ **Sommer Bros. Constr. Co.,** Iselin, N. J. Own Forces. **$3,000,000-$4,000,000.** expansion of Thruway Plaza, 6 STORES, incl. Sears, Roebuck & Co., Oppenheim Collins, and others, CHEEKTOWAGA, N. Y. Awarded Apr. 3.

▲ **Audwin Gardens Homes,** c/o Par-Sen Realty Corp., 70 W. Montauk Hy., Lindenhurst, N. Y. Owner Builds. **$2,000,000.** 160 HOUSES on tract at Sunrise Hy. and Irish Lane, ISLIP, N. Y.

▲ **Pelnorth Realty Corp.,** c/o Kavy & Kavovitt, archts., 44 Court St., Brooklyn 2, N. Y. Owner Builds. **$2,400,000.** three 6 story APARTMENTS, 120, 130, 140 Pelham Bay Rd., NEW ROCHELLE, N. Y.

▲ **Sprain Constr. Co.,** 191 Drake Ave., New Rochelle, N. Y. CA Est. **$3,800,000.** 4 APARTMENTS at tract on Pelham Bay Parkway at Davenport Neck Rd., NEW ROCHELLE, N. Y. Harbor House Apartments, c/o Maxon Sells and Ficke, archts., 724 Fifth Ave., New York 19, N. Y.

▲ **J. Rich Steers Co.,** 17 Battery Pl., New York 4, N. Y., LB **$7,393,000** (3 bidders) Buildings Nos. 178, 179, 180, 181 and 182 and wharf, Contract PN-300-004, PORT NEWARK, N. J. The Port of New York Auth., 111 Eighth Ave., New York 11, N. Y. Bids Apr. 17. CD 3/12.

▲ **Savarein Constr. Co.,** 181 Broadway, New York, N. Y., LB **$1,564,888,** 20 buildings, incl. 109 unit HOUSING, PRINCETON, N. J. Institute of Advanced Study, Olden Lane, Princeton, N. J. Bids Apr. 12. CD 3/9.

▲ **Ragnar Benson, Inc.,** Gateway Center, Pittsburgh, Pa. CA Est. **$1,500,000.** 1 story, 250x300 ft., steel, brick WAREHOUSE and SHIPPING, BEAVER, PA. Westinghouse Electric Corp., Gateway Center, Pittsburgh, Pa. CD 11/15/.

▲ **Seventh Corp.,** 551 Howe Rd., Merion, Pa. CA **$7,000,000.** RESIDENTIAL DEVELOPMENT, 468 units, Upper Merion Twp., Valley Forge Rd., GULPH MILLS, PA. The Candlebrook Co., 1528 Walnut St., Phila., Pa. CD 2/27, under CA.

▲ **The Lummus Co.,** 385 Madison Ave., New York, N. Y. CA Est. **$3,000,000.** design and construct steel, concrete Phthalic Anhydride PLANT, Neville Island, PITTSBURGH, PA. Pittsburgh Coke & Chemical Corp., Grant Bldg., Pittsburgh, Pa. CD 10/27.

▲ **Gruver-Cooley Constr. Co.,** Investment Bldg., Wash., D. C. Owner Builds. **$5,465,000.** 200 brick HOMES, Rock Creek Highlands, KENSINGTON, MD.

(Continued on page 99)

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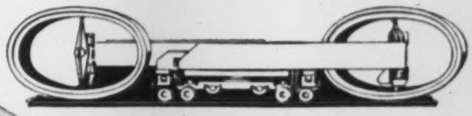
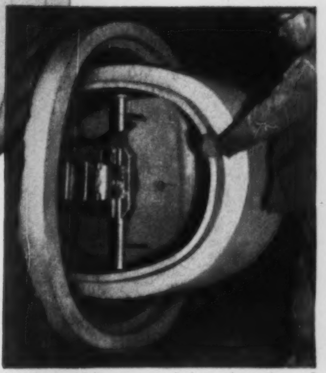


Inner Circles
Tunneliner Pipe
TRADE MARK

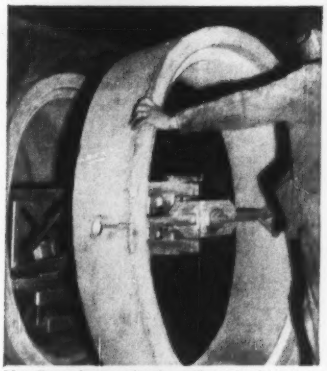
PRECAST REINFORCED CONCRETE TUNNEL PIPE



Worker guides an oval-shaped section of Inner Circle pipe which the Tunnelugger has carried through conduit already laid.

PASS PIPE THROUGH PIPE UNDERGROUND

without disrupting surface traffic!



The Tunnelugger backs off with the pipe still on the arms to set it firmly in place, assuring an even, tight joint.

Inner Circles methods using elliptical Tunneliner pipe now make it possible to pass full structural ring, precast, concrete pipe through conduit already laid—even on curves. Surface excavation is eliminated...traffic is undisturbed...work progresses regardless of weather conditions. Less equipment and fewer laborers are required, yet sewers are completed faster at less cost, with pipe strengths *pretested* by commercial laboratory procedures.

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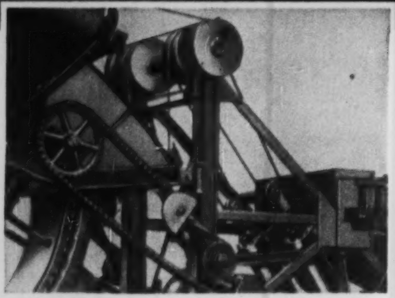

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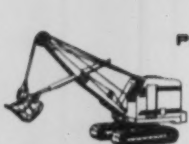
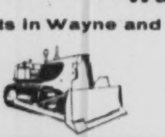
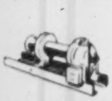


Gar Wood Excavators



Gar Wood Tractor Equipment



Gar Wood Winches

Gar Wood-Buckeye Finegraders

Gar Wood-Buckeye Ditchers

Gar Wood-St. Paul Hoists & Bodies

(Continued from page 96)

Patterson & Worland, 2 Thomas Circle, Wash., D. C., archts.

▲ **Mahony-Troast Constr. Co.,** 790 Bloomfield Ave., Clifton, N. J., CA, Est. **$4,000,000-$5,000,000.** MFG. PLANT addns., NEWARK, DEL. Chrysler Corp., 341 Massachusetts Ave., Detroit, Mich. Bids Apr. 3. CD 3/27.

SOUTH

HEAVY CONSTRUCTION—BA

STATE HIGHWAY LETTINGS

BRIDGES

May 2 Virginia

STREETS AND ROADS

May 2 Virginia

BUILDINGS—BA

▲ **Fla., Eglin Air Force Base**—HOUSING—BA On Or About 5/29—Base Procurement Office, Building NR 358, Eglin Air Force Base, Fla., construct and finance 500-family housing units, No. 08-603-56-562. CD 5/17.

HEAVY CONSTRUCTION—LB & CA

▲ **Gust K. Newberg Constr. Co.,** 2040 Ashland Ave., Chicago, Ill. CA **$5,064,000**. sewage treatment plant, various bldgs., interceptor sewers, LOUISVILLE, KY. Louisville & Jefferson County Metropolitan Sewer Dist., 412 W. Market St., Louisville, Ky. Bids Mar. 27, awarded Apr. 13. CD 3/30, under LB.

BUILDINGS—LB & CA

▲ **Doyle & Russell,** 823 W. 21 St., Norfolk, Va., LB **$3,905,200,** 9 story first wing of HOSPITAL, NORFOLK, VA. Norfolk General Hospital, Raleigh Ave., Norfolk, Va. Watson & Hart, 914 Summit Ave., Greensboro, N. C., consult. engrs. Samuel Hannaford & Sons, Dixie Terminal Bldg., Cincinnati, O. assoc. archts. Bids Apr. 12. CD 2/6.

▲ **W. L. Hay,** 120 Crown Ave., Fort Thomas, Ky. Owner Builds. **$2,250,000**. 112 one story, bsmnt., brick HOMES, Spence Memorial Hy. west of Southgate Ave., FORT THOMAS, KY. Morlidge & Morlidge, 104 W. Fourth St., Cincinnati, O., engrs.

MIDDLE WEST

BUILDINGS—BA

▲ **O., Findlay**—HOSPITAL—BA 5/4—Comrs. Hancock Co., Court House, hospital, Blanchard Valley Hospital. $1,750,000. CD 11/8/54.

HEAVY CONSTRUCTION—LB & CA

▲ **Ashbach Constr. Co.,** 1910 West County Road C, St. Paul, Minn., CA Est. **$2,803,300**. dam and generating plant for hydro-plant redevelopment, Red Cedar River, Menomonie, WISCONSIN, Northern State W. Power Co., 15 S. 5 St., Minneapolis, Minn. Bids Mar. 2. CD 9/9.

▲ **MICHIGAN**—State Hy. Dpt., Lewis Cass Bldg., Lansing,

Mich.—**S. J. Groves & Sons,** Wesley Temple Bldg., Minneapolis, Minn. LB **$3,175,827,** est. $3,120,000. (13 bidders) 24 ft. dual c. conc. 6.618 mi. on relocation of U.S.-23 from S. Thompson St. to near Hill Rd., 6 bridges and interchanges, BM 25-32 C1, BM of 25-6-4 C1-RO, etc., Genesee Co.; LB **$1,975,290,** est. $2,130,000. (13 bidders) 22 ft. dual c. conc. 8.936 mi. on US-127 from Leslie north to North of Mason, M 33-79 C1-RN, M 33-75 C4-RN, Ingham Co.;

Mich.—**Loselle Constr. Co.,** 1555 Goddard St., Wyandotte, Mich. LB **$910,999,** est. $960,000. (13' bidders) dual c. conc. 2.409 mi. Fort St. Connection to Detroit-Toledo Expressway, IN 82-191 C5-UN C6-RN (In 05 1 1), Wayne Co.;

Mich.—**Cross & White,** 3849 3 Mile Rd. N. E., Grand Rapids, Mich. LB **$395,633,** est. $400,000. c. conc. 3.737 mi. US-25 from Lakeport, F 74-19 C8-R, etc., St. Clair and Sanilac Counties;

Mich.—**Ann Arbor Constr. Co.,** 221 Felch St., Ann Arbor, Mich. LB **$447,845,** est. $430,000. (11 bidders) c. conc. wid'n. 24 ft. b. conc. 9.757 mi. US-27, M 72-21 C4-RN, M 72-24 C5 RN, Roscommon Co.

Mich.—**Bairley & Lindley,** Trenton, Mich. LB **$314,156**. est. $350,000. (5 bidders) c. conc with curb and gutter 1.162 mi. on US-23 from Little Black River Bridge east to Main St., F 16-3 C2-U (F 123 3), Cheboygan Co.;

Mich.—**Cooke Constr. Co.,** 1106 Penobscot Bldg., Detroit, Mich. LB **$110,217,** est. $120,000. (12 bidders) b. conc. bit. aggregate 6.796 mi. M-51 and US-25, SS 74-10 C15 U, SS 74-10 C16-R (S 768 2), etc., St. Clair Co.;

Mich.—**East Shore Asphalt Paving Co.,** Alpena, Mich. LB **$316,247,** est. $320,000. (16 bidders) stabilized aggregate wid'n. bit. aggregate surf. 13.777 mi. US-23 from County line to F street., Cheboygan, F 16-17 C10-R, C11-U (F 154 14), Cheboygan Co.;

Mich.—**M. T. Lardner & Co.,** Port Huron, Mich. LB **$87,952,** est. $110,000. (11 bidders) b. conc. 4.411 mi. M-29 in Marine City and village of Algonac, M 77-11 C4-U C5-U C7-U C8-U, etc., St. Clair Co.;

Mich.—**Great Lakes Dock & Materials Co.,** Muskegon, Mich. LB **$81,345,** est. $80,000. (8 bidders) c. conc. 2.582 mi. parts of M-20 and US-31, M 61-8 C3-U, M 61-11 C16-U, etc., Muskegon Co.;

Mich.—**Paul C. Miller,** Sparta, Mich. LB **$280,884,** est. $300,000. (15 bidders) b. conc. wearing course 12.481 mi. M-24 and M-30, F 79-40 C6-U C7-R (F 410 7), etc., Tuscola Co.;

Mich.—**C. E. Utterback,** Mounta Pleasant, Mich. LB **$261,276,** est. $340,000. (8 bidders) stabilized ag-

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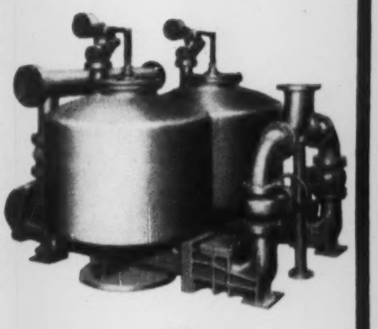

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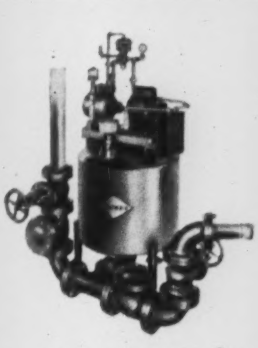

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site uses seismic survey
to map bedrock

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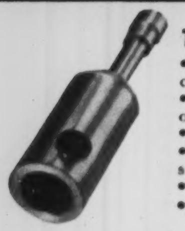

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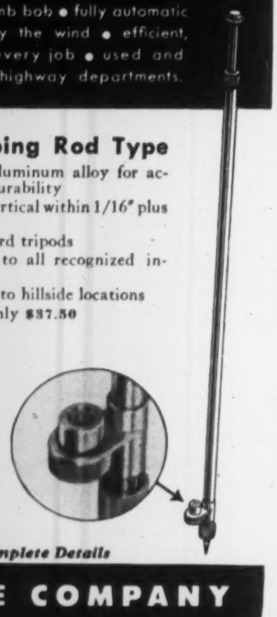

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gregate surf. 3.3938 mi. M-63 from M-72 north, FH 1-14 C1-R, FH 6G, Alcona Co.;

Mich.—**Wright Constr. Co.**, 3800 Wood St., Lansing, Mich. LB **$196,784**, est. $200,000. (6 bidders) stabilized aggregte wid'n. b. conc. 1.207 mi. M-57 through Montrose Village to Flint River Bridge, SS 25-42 C6-U C7-R (S 514), Genesee Co.;

Mich.—**R. W. Meyer Co.**, Cadillac, Mich. LB **$248,133**, est. $230,000. (9 bidders) aggregate base wid'n. for ½ mi. bit. binder, c. conc. 1.406 mi. M-63, F 43-5 C6U (F 268 5), SS 43-11 C4-U (S 864 1), Lake Co., Bids Apr. 11;

Mich.—rejected bids Apr. 11, stabilized aggregate surf. course 7.227 mi. M-68 from US-23 west from Rogers City bridge over Trout River 3.8 mi. west of Rogers City, F 71-17 C6-R F 71-17 C7-U (F 43), M B1 of 71-14 2 C2-R, Presque Isle Co. CD 4/2 and 4/4.

BUILDINGS—LB & CA

▲ **Sam W. Emerson Co.**, 1836 Euclid Ave., Cleveland 15, O. CA Est. **$4,500,000.** PLANT and OFFICE, Tiedeman Rd., BROOKLYN, O. Lamson & Sessions Co., 1971 W. 85 St., Cleveland 2, O. Geo. S. Rider Co., Terminal Tower, Cleveland, O., archt. Awarded Mar. 30. CD 7/18.

▲ **George & Norbert Vonderhaar**, 6127 Bridgetown Rd., Cincinnati, O. Own Forces. **$2,400,000**. 95 brick bsmnt. HOMES, Werk Rd., west of Ebenezer, CINCINNATI, O. Nunlist & Frolicher, Traction Bldg., Cincinnati, O. engrs. Awarded Apr. 12.

▲ **Garden Valley Homes, Inc.**, 1950 Lee Rd., Cleveland 18, O. CA Est. **$2,150,000**. 222 LOW RENTAL HOUSING UNITS Garden Valley Redevelopment Area, CLEVELAND, O. Garden Valley Homes, Inc. (subsidiary of Dunlop & Johnston, Inc.) 1950 Lee Rd., Cleveland 18, O. Awarded Apr. 4.

▲ **Humel Constr. Co.**, 17706 Miles Ave., Cleveland, O. CA **$3,000,000**. DEPARTMENT STORE, W. 130 St. and Smith Rd., PARMA, O. Halle Bros., 1228 Euclid St., Cleveland, O. Matzinger & Grosel, The Arcade, Cleveland 14, O. archts. Raymond Loewy Assocs., 488 Madison Ave., New York, N. Y., industrial designers.

▲ **Park Land Development Co.**, 6351 Stumpf Rd., Parma 29, O. CA Est. **$50,000,000**. 234 APARTMENTS, 250 tri-level HOMES, SHOPPING CENTER, DEPARTMENT STORE, 300-acre site, Snow and Stumpf Rds., PARMA and PARMA HEIGHTS, O. Don A. Loftus & Frank D. Johnson, Marshall Bldg., Cleveland 13, O. Wm. H. Harris, Marshall Bldg., Cleveland 13, O., archt. Awarded Apr. 13. CD 11/18/48.

▲ **Samuel Brody & Sons**, 2429 National Bank Bldg., Detroit, Mich. Owner Builds. **$2,000,000.** Parkway Acres, brick ranch HOMES, Middlebelt between Ann Arbor Trial and Warren Rd., DEARBORN, MICH.

WEST OF MISSISSIPPI

HEAVY CONSTRUCTION—BA

STATE HIGHWAY LETTINGS

BRIDGES

May 1 Iowa — May 16 Texas

STREETS AND ROADS

May 1 Iowa

BUILDINGS—BA

▲ **Tex., San Antonio**—SHOPPING CENTER—Bids Asked—Northview Corp., c/o John B. Mills, Merc. Sec. Bldg., Dallas, 1 and 2 story, 350,000 sq. ft. shopping center. $5,000,000. Harvin C. Moore, 2006 W. Alabama St., Houston, archt. Walter P. Moore, 2 Pinedale St., J. L. Davis, 9240 Kenilworth St., and W. B. Joseph, M & M Bldg., Houston, engrs. CD 5/26.

HEAVY CONSTRUCTION—LB & CA

▲ **Martin K. Eby Constr. Co.**, 610 N. Main St., Wichita, Kan. CA **$2,596,600**, est. $2,443,000. 4 place B52 hangar (industrial bldg.), WICHITA, KAN. Boeing Airplane Co., Plant No. II, Personnel Bldg., Wichita, Kan. Bids Apr. 12. CD 4/12.

▲ **Colorado Tunnel Constructors**, 725 W. 39 Ave., Denver, Colo., LB **$7,596,835** Straight Creek Site; LB **$16,465,440** Berthoud Pass Site, Continental Divide vehicular tunnel, Summit, Clear Creek and Grand Counties, COLORADO. State Hy. Dpt., 4201 E. Arkansas St., Denver, Colo. Bids Apr. 16. CD 3/26.

BUILDINGS—LB & CA

▲ **Lovering Constr. Co.**, 59 W. Kellogg Blvd., St. Paul, Minn. and **J. S. Sweitzer & Son, Inc.**, 739 Pillsbury St., St. Paul, Minn. (jointly), LB **$4,094,390**. (3 bidders) general constr. 8 story, sub-base, 482x146 ft. central OFFICE for Minn. Hy. Dpt. at Rice St. and Fuller Ave., ST. PAUL, MINN. State Dpt. Admin., P. T. Peterson, dir. Purchases, 19 State Capitol, St. Paul, Minn. Bids Apr. 12. CD 3/6;
R. L. Anderson-Cherne, Inc., 529 Cleveland Ave. N., St. Paul, Minn. LB **$1,490,000**. (4 bidders) mechanical works (St. Paul, Minn.);
Kehne Electric Co., 722 Raymond Ave., St. Paul, Minn. LB **$526,922**. (5 bidders) electrical works (St. Paul, Minn.).

▲† **Olson Constr. Co.**, 410 S. 7th St., Lincoln, Neb. LB **$2,754,000**. addnl. bldgs., utilities at HOSPITAL, FORT MEAD, S. D. Veterans Admin., Vermont Ave. between H and I Sts. N. W., Wash. 25, D. C. Bids Apr. 17. CD 2/17.

▲ **McFadden & Miller Constr. Co.**, 2514 W. Mockingbird Lane, Dallas, Tex. CA Est. **$6,500,000.** FURNITURE MART, in Trinity Industrial Dist. on 25-acre site, 3,000 car parking, DALLAS, TEX. Trammel Crow, 425 S. Field St., Dallas, Tex. CD 12/3/54.

(Continued on page 102)

Super drive for a super grader

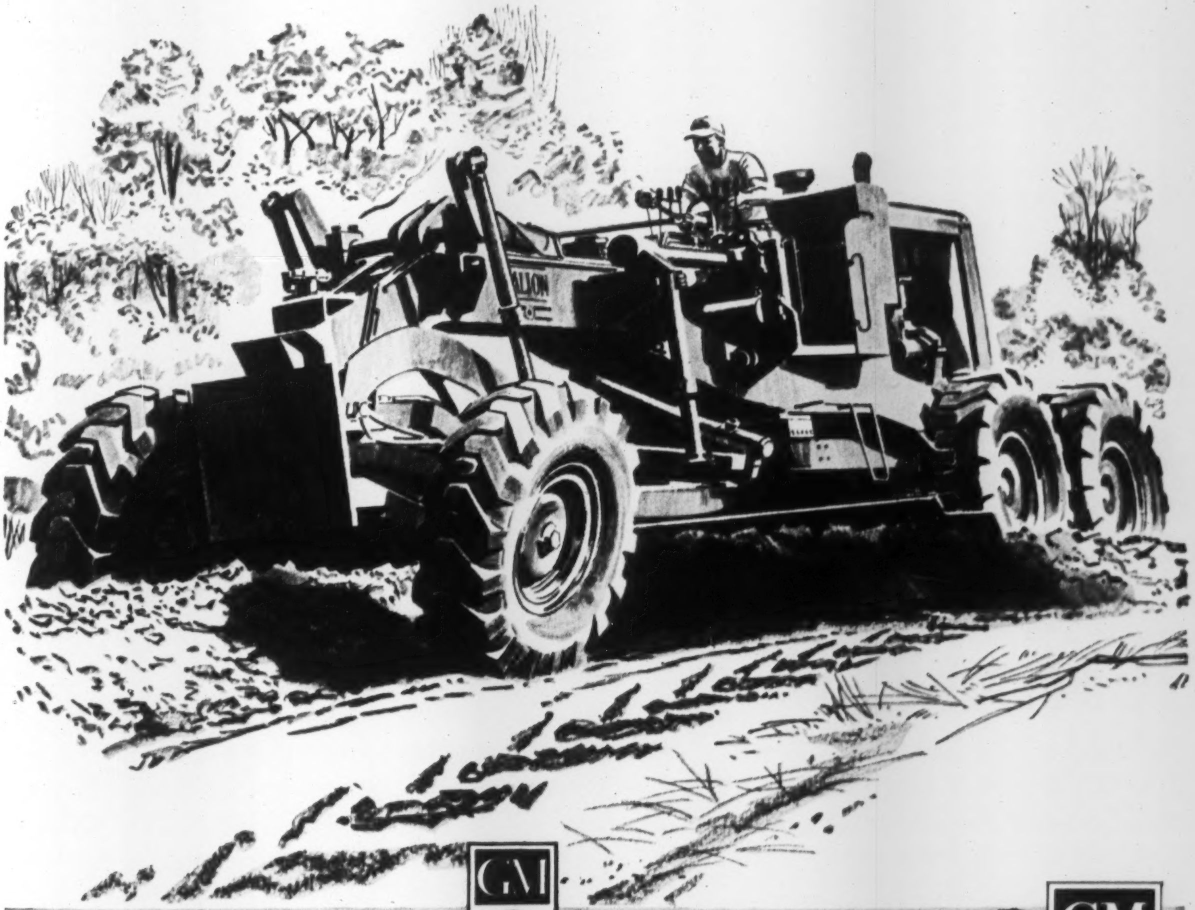
To get more "push-power" *at the blade,* Galion uses an Allison Torqmatic Drive in its new T-700 Grade-O-Matic grader.

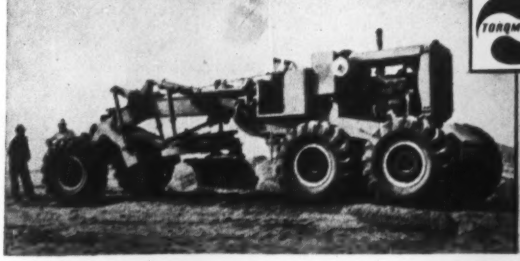
Galion says the integrated Torqmatic Converter-Transmission *team* "eliminates the foot clutch – ends 'down-time' for clutch maintenance and repairs – does the shifting *work* for you – makes driving fast and easy."

The Allison Torqmatic Drive multiplies engine torque up to 13½ times, absorbs harmful shock loads and prevents engine lugging and stalling. It gives the T-700 3 forward and 3 reverse speeds–from 0.9 to 20 m.p.h.– and permits the operator to make any shift while moving in either direction.

And the Torqmatic Drive reduces operator-skill requirements in this 20-ton grader because it eliminates the "human element" needed to get top grader performance.

For full information on the Galion T-700 see your Galion dealer or write Galion Iron Works, Galion, Ohio.





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TORQMATIC DRIVES

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Indianapolis 6, Indiana

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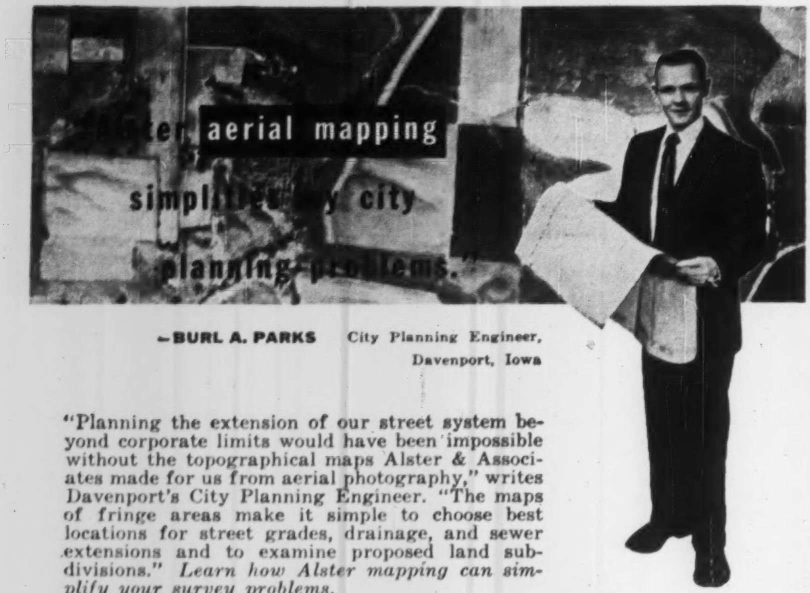

—BURL A. PARKS City Planning Engineer,
Davenport, Iowa

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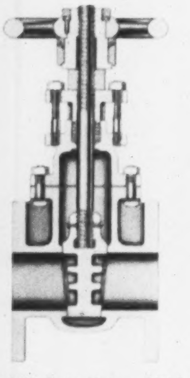

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BRONZE
PRODUCTS
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(Continued from page 100)

▲ **Olson Brothers, Contractors,** 3801 Kirby St., Houston, Tex. Owner Builds. **$2,000,000.** . 4 story OFFICE, HOUSTON, TEX. CD 4/17.

▲ **Aluminum Co. of America,** Port Lavaca, Tex. Own Forces. Over **$45,000,000.** alumina PLANT; **$500,000,** STORAGE or WAREHOUSING, at Point Comfort, PORT LAVACA, TEX. CD 8/10.

▲ **Ebasco Services, Inc.,** 2 Rector St., New York, N. Y. CA **$8,000,000.** 44,000 KW steam electric generating PLANT and POWER HOUSE to serve northeast Montana and northwest North Dakota area, will use pulverized lignite and gas as fuel, SYDNEY, MONT. Montana-Dakota Utilities Co., F. R. Gamble, vice pres., 831 Second Ave. S., Minneapolis, Minn. Arthur D. Little & Co., 30 Memorial Dr., Cambridge, Mass., made feasibility report.

▲ **Plains Constr. Co.,** Clovis, N. M. CA **$2,331,786.** 187-unit family HOUSING, Clovis Air Force Base, CLOVIS, N. M. Purch. & Contg. Div., Clovis Air Force Base, Clovis, N. M. CD 3/19, under LB.

FAR WEST

HEAVY CONSTRUCTION—BA

STATE HIGHWAY LETTINGS

STREETS AND ROADS
May 9, 10 California

HEAVY CONSTRUCTION—LB & CA

▲ **Kuckenberg Constr. Co.,** 11104 N.E. Holman St., Portland, Ore. CA **$4,789,981.** east side approaches to Morrison and Hawthorne Bridges, PORTLAND, ORE. Multnomah Co., Court House, Portland, Ore. Bids Apr. 10. CD 4/12, under LB.

▲ **Bechtel Corp.,** 220 Bush St., San Francisco, Calif., CA, **$5,000,000.** semi-underground power house on Feather River part of Poe project, CALIFORNIA. Pacific Gas & Electric Co., 245 Market St., San Francisco 6, Calif.

BUILDINGS—LB & CA

▲ **Ivan Tweedie,** P. O. Box 29, Monterey, Calif., Owner Builds, **$2,000,000.** HOUSING SUBDIVISION Hy. 1 and E. Garrison Rd., MARINA, CALIF.

CANADA

HEAVY CONSTRUCTION—BA

STATE HIGHWAY LETTINGS
BRIDGES
May 2 Ontario

STREETS AND ROADS
May 2 Ontario

BUILDINGS—BA

▲ **Ont., Oakville**—PLANT—BA 5/1—Ford Motor Co. of Canada Ltd., 120 Bloor St. E., Toronto, 250 ft. long plant extension, $4,000,000. L. J. Donaldson, c/o owner, engr. CD 4/13.

HEAVY CONSTRUCTION—LB & CA

▲ **ALBERTA**—Dpt. P. Wks., Hunter Bldg., Ottawa, Ont.

Square M. Construction Ltd. & Coleman Colleries Ltd., Edmonton, Alta., CA **$2,184,207,** grading, provision of culverts, base course, prime coat 10 mi. Trans-Canada Hy., Banff National Park, Banff. Bids Feb. 15, awarded Mar. 20. **(Correction-contractors).** CD 2/27, under CA.

BUILDINGS—LB & CA

▲ **M. Sullivan & Son, Ltd.,** Elgin St., Arnprior, Ont. CA **$2,351,425.** Military HOSPITAL, outside services at Army Camp, BARRIEFIELD, ONT. Defence Constr. Ltd., 56 Lyon St., Ottawa, Ont. CD 8/3/54.

▲ **J. P. Morin Ltd.,** 528 Notre Dame St., Cap de la Madeleine, Que., CA Total est over **$2,000,000.** superstructure of BASILICA, CAP DE LA MADELEINE, QUE. Rev. Oblate Fathers of the Immaculate Mary, Cap de la Madeleine, Que. Leo Paul Roy, 5925 Monkland Ave., Montreal, Que., engr. Awarded Apr. 4. CD 8/19/53.

▲ **Foundation Co. of Canada Ltd.,** 1900 Sherbrooke St. W., Montreal, Que., CA Est. **$16,000,000** 200-ton per day capacity high quality bleached sulphate PAPER MILL, THURSO, QUE. Thurso Pulp & Paper Co., Thurso, Que. Charlton & Johnson, 1015 Dominion Square Bldg., Montreal, Que., engrs. CD 4/16.

▲ **E. G. M. Cape & Co.,** 4898 Western Ave., Montreal, Que., CA Total est. **$6,000,000.** CATALYST PLANT, VALLEYFIELD, QUE. Davison Chemical Co. Ltd., c/o W. R. Grace & Co., Davison Chemical Bldg., Baltimore, Md., U.S.A. J. M. Lafleur, 17 Nicholson St., Valleyfield, Que. archt. Awarded Apr. 5. CD 1/27/55.

▲ **Dawson & Hall Ltd.,** 775 Clark Dr., Vancouver, B. C., CA **$4,262,232,** 120-bed HOSPITAL, incl. nurses residence, staff quarters power house, laundry bldg., etc., WHITEHORSE, YUKON TERRITORY. Dpt. P. Wks., Hunter Bldg., Ottawa, Ont. Bids Aug. 24, awarded Mar. 31. CD 9/20, under LB.

LATIN AMERICA

HEAVY CONSTRUCTION—LB & CA

▲ **Ingenieros Civiles Asociados D. A. de C. V.,** Calle des las Artes 142, Mexico City, Mexico, D. F. CA **$12,370,602.** Mexican sect. Anzalduas Dam, Bajo River Brovo, Lower Rio Grande Flood Control, MEXICO and TEXAS. International Boundary & Water Comm. (Mexican Sect.), Ciudad Juarez, Chih. CD 2/23/56, under Texas.

(Proposal Advertisements see p. 124 to 126)

WHY ENGINEERS FEEL AT HOME AT ROCKETDYNE

First and foremost, ROCKETDYNE talks your language—and understands it too. Your associates and supervisors here are professional people like you. They respect your status, your thinking, your ideas and your interest in technical advancement.

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It may surprise you to know you can qualify for a career at ROCKETDYNE *with or without specific rocket engine experience!* Engineering experience in heating and ventilating, hydraulics, pumps, turbines, combustion devices, controls, dynamics, structures and instrumentation are just a few of the related fields that could open your future at ROCKETDYNE.

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ROCKETDYNE is North American's rocket engine division. It has just moved into new ultra-modern headquarters in Canoga Park, located in the beautiful West San Fernando Valley of Los Angeles. This area is famous for its fine residential sections, modern shopping-center convenience, varied recreational and entertainment facilities. Any point in the San Fernando Valley is just minutes drive from the beaches, and the weather is pleasant all year around. Many engineers are interested in advanced courses offered by fine schools like UCLA, USC and Cal Tech, all within a short drive from our headquarters.

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DESIGN & DEVELOPMENT ENGINEERS
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Experienced on engine systems, combustion devices, turbines, pumps and engine instrumentation.

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To analyze rocket engine control systems utilizing electronic analog and digital computers. B.S., M.E., or B.S.E.E. necessary. Prefer advanced degree. Experience in servomechanisms, systems analysis desired.

THERMODYNAMICIST
To analyze, design and develop high speed subsonic and supersonic turbines. Jet engine or industrial steam turbine experience desired.

SYSTEMS ENGINEERS
ENVIRONMENTAL TEST ENGINEERS
STANDARDS ENGINEERS
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Write Mr. Grant Baldwin, Rocketdyne Engineering Personnel, Dept. 596-N, 6633 Canoga Ave., Canoga Park, Calif.

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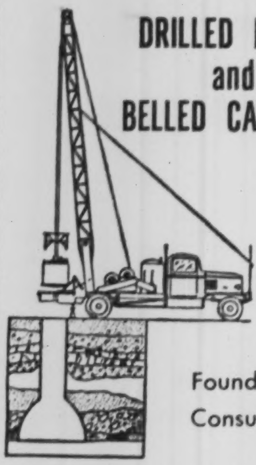

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Unit Prices

Heavy Bidding on Massachusetts Water Mains

Northboro, Mass., received 17 useful bids on their $87,730 water mains extension. One additional bid was withdrawn because of inadequate allowance for paving. Camp, Dresser & McKee, Boston, Mass., are consulting engineers.

The contract went to Z & S Construction Company of Roslindale, Mass. Their price topped the withdrawn low bid by 1.2% but was 6.8% below the third low bid and 15.5% below the engineers' estimate.

Bidders bid also on time of completion. The successful bid was 120 days which compares to a bidding range from 90 to 200 days.

Work under the contract includes 18,300 lin ft of pipe, excavation, paving, one bridge and three railroad crossings. The town furnishes 950 lin ft of pipe and all valves and boxes, hydrants, cocks and copper tubing.

Cast iron pipe must meet ASTM standard Class 150.

Minimum wage rates include $2.05 for truck drivers, pipe layers, asphalt breakers and common laborers and $3.125 to $3.50 for equipment operators.

The bidders include:

1	J. W. Constr. Co., Inc., Dorchester, Mass	$87,730*
2C	Z & S Constr. Co., Inc., Roslindale, Mass	88,797
3	E. Susi & Williams Corp., Dedham, Mass	95,199
18	J. Andreassi & Son, Roslindale, Mass	149,638
EE	Camp, Dresser & McKee, Boston, Mass	105,000

Bids: 2-13-56			Quan-	Unit	Prices
Item		Unit	tity	2C	3
Asb cmt pipe, 6"	i†	lf	950	$1.00	$1.40
12" nom size	†	lf	5,130	4.78	15.35
10" nom size	†	lf	4,670	3.92	4.25
8"	†	lf	7,220	3.33	3.50
CIP, 6", for hydrant branch	†	lf	330	7.00	4.00
Fittings, CI, std		lb	25,000	0.25	0.20
Hub-end gate, valv & box,					
12"	i	ea	13	15.00	15.00
10"	i	ea	5	15.00	15.00
8"	i	ea	16	10.00	10.00
6"	i	ea	43	5.00	5.00
Tapp sleev, valv & box,					
12x12"	i	ea	1	150.00	150.00
12x10"	i	ea	1	150.00	150.00
12x8"	i	ea	1	150.00	100.00
10x8"	i	ea	4	150.00	100.00
8x8"	i	ea	2	150.00	100.00
6x6"	i	ea	3	150.00	75.00
Hydrants	i	ea	32	25.00	25.00
Corp cocks, ¾"	i	ea	30	4.00	2.00
1"	i	ea	4	4.00	2.00
Curb cocks & box, ¾"	i	ea	30	4.00	2.00
1"	i	ea	4	4.00	2.00
Tubes, copper, ¾"	i	lf	300	1.25	1.50
1"	i	lf	40	1.25	2.00
Excav, rock		cy	250	7.00	8.00
boulder		cy	100	6.00	8.00
Gravel for misc use		cy	1,000	1.50	1.50
Pave, conc, remov & replace		sy	25	6.00	6.00
bit, replace		sy	850	1.50	2.00
Crossing, small stone arch bri, 45'±2" foamglas insul		ls	job	700.00	1,500
Extra for RR crossing, 1 triple & 2 single tracks		ls	job	2,000	2,500
Clean up & misc		ls	job	500.00	1,500

** Asked to withdraw bid because of inadequate allowance for paving. *† Includes 2" bit conc paving on all trenches.

Texas Water Line Takes Bids Four Ways

For this 15.5-mile Rockwall-Royse City Pipe Line the North Texas Municipal Water District took bids on 16-12 in. pipe vs 14-10 in. and for two types of pipe. The contract went to the 16-in. and 12-in. reinforced concrete pipe alternate, although this was 5.4% above the price of the smaller line. No bids were received from the two low bidders on an option for cast iron pipe of either size.

A unit price story on the 42-36 in. pipe line from Wylie to Dallas, an earlier project of the Water District, was reported by ENR 9-22-55, p. 48.

E. H. Reeder Construction Company of Dallas, Texas, took the contract on their $308,457 low bid. This was 1.4% below the second low bid and 13.9% below the engineer's estimate. Forrest and Cotton, Dallas, are consulting engineers.

Minimum wage rates include $1.00 for unskilled laborers, $1.25 for pipe layers and asphalt plant mixers, $1.25 to $2.25 for equipment operators, and $1.50 to $1.75 for cement finishers.

The bidders on the new project include:

1C	E. H. Reeder Constr. Co., Dallas, Tex	$308,458
2	H. H. Null Constr. Co., Houston, Tex	312,814
HB	F. S. Oldt Company, Dallas, Tex	392,489
EE	Forrest & Cotton, Praetorian Bldg., Dallas	358,200

Bids: 2-7-56		Quantity		Unit Prices	
Item	Unit	Sec A	Sec B	1C	2
RCP, 16"	lf	31,645		$3.80	$3.75
12"	lf		50,445	3.35	3.38
CIP, mech joint, 16"	lf	55		10.50	8.00
12"	lf		55	8.50	6.50
Encsmt pipe, 30", bore & jack	lf	55		30.00	25.00
21", b&j	lf		55	20.00	18.00
Air valv installns, 2"	ea	10	18	200.00	295.00
Blow-off valv, 6"	ea	8	16	180.00	236.00
Outlet, flanged, 6", with gate valv, 6"	ea	1	1	165.00	130.00
service, & stop, 2"	ea	1	1	40.00	38.00
1"	ea	62	98	9.00	6.90
Conc, cl C	cy	50	100	14.00	15.00
Gravel base, 8"	sy	60	350	1.60	3.00
Pave, asph conc, 1"	sy	35		1.60	3.00
asph conc, 1"	sy		385	1.40	3.00
Backfill, gravel	cy	115	35	2.00	2.50

Total for Section A:	1C	$127,764	2	$127,240
Total for Section B:	1C	$180,694	2	$185,574

Alternate Bid Items:

Item	Unit	Sec A	Sec B	1C	2
RCP, 14"	lf	31,645		$3.50	$3.46
10"	lf		50,445	3.25	3.29
CIP, mech joint, 14"	lf	55		9.40	6.00
10"	lf		55	6.50	6.50
Encsmt pipe, 24", bore & jack	lf	55		20.00	20.00
18", b&j	lf		55	18.00	18.00

Time allowed: 200 calendar days
Liquidated damages: $50.00 per day

When a welded frame building has more useable space...

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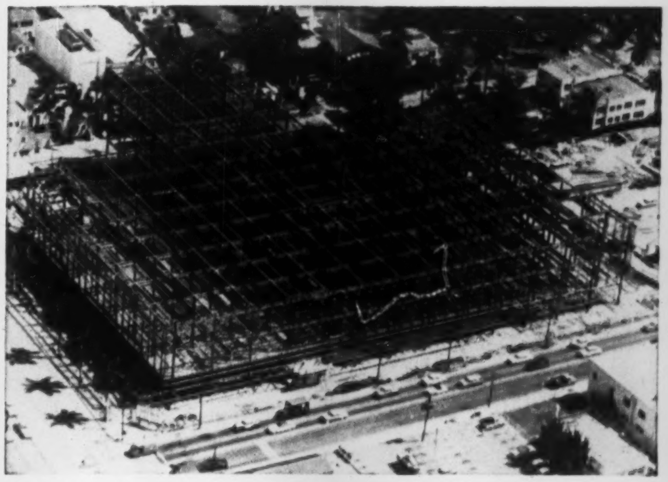

1200-ton all-welded framework for Jordan Marsh Department Store, Miami, Florida.

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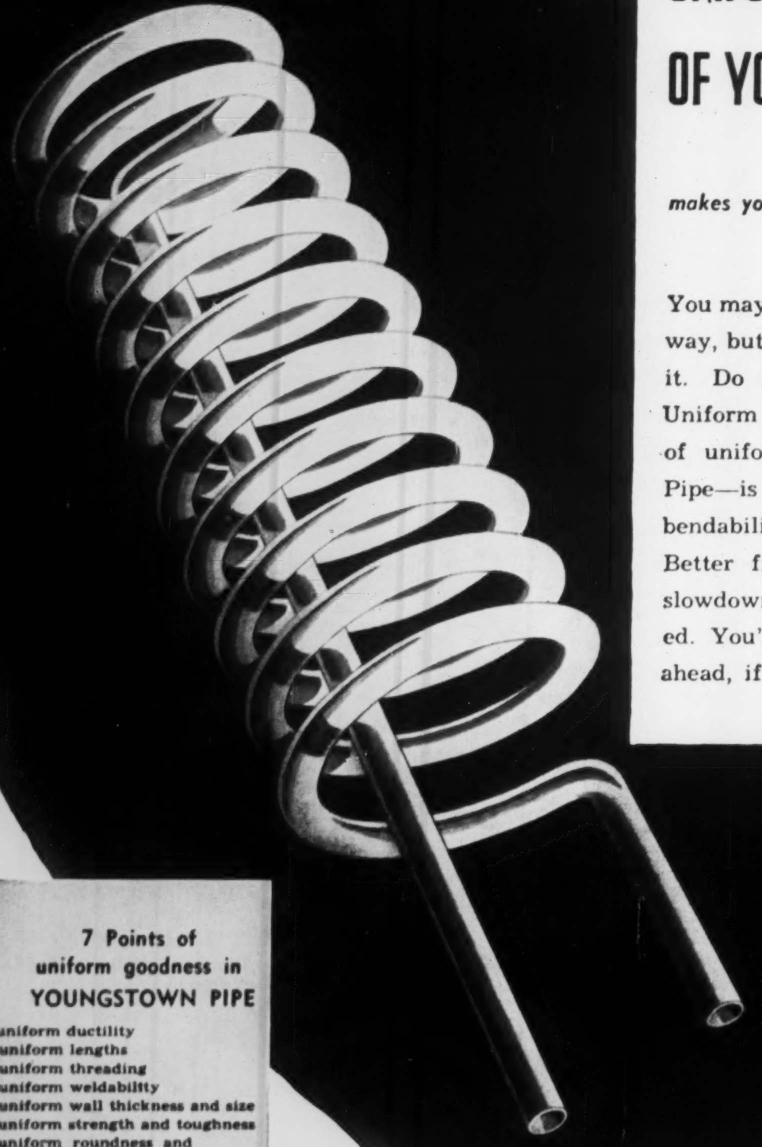

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Materials and Labor Prices Monthly Market Quotations by ENR Field Reporters

See following ENR issues for OTHER PRICES:

- May 3—Wage Rates, Building Board, Lath, Insulation
- May 10—Cement, Aggregate, Ready-mixed Concrete, Asphalt
- May 17—Iron and Steel Products, Pipe
- May 24—Wood Products, Glass, Explosives, Chemicals

STRUCTURAL CLAY BUILDING TILE, BRICK AND LIME—DELIVERED

	STRUCTURAL CLAY TILE PARTITION—SCORED Per M. lots of 2,000 pieces or over,			STRUCTURAL CLAY TILE—LOAD BEARING—SCORED Per M. lots of 2,000 pieces or over,			BRICK Per M. in quantity		LIME Per ton, in paper, Carload lot,		
	3x12x12 in.	4x12x12 in.	8x12x12 in.	8x12x12 in.	10x12x12 in.	12x12x12 in.	Common backing	Straight hard	Hydrated finishing	Common hydrated	Pulverized or lump
Atlanta	$148.25p	$148.25p	$296.50p	$333.55p	......	......	$32.44p	$32.44p	$32.70	$23.50	$24.50
Baltimore	202.00	216.00	405.00	458.50	596.00	681.00	36.00k	41.00k	33.00	22.00	.....
Birmingham	135.00p	152.00p	......	303.00p	376.00p	465.00p	27.00ff	38.00gg	33.35	22.30	26.33
Boston	205.00†	218.40†	459.00†	467.80†	......	......	40.00p	44.00p	35.20†	30.00†	.....
Chicago	135.00	145.00	280.00	......	......	......	28.00	30.00	36.00	29.00	.....
Cincinnati	205.00j	225.00j	296.00jdd	213.00	288.00	314.00	45.00j	46.00j	28.50j	24.25j	28.50
Cleveland	195.00**	207.00**	......	......	......	......	40.00	42.00	29.75	24.75	.....
Dallas	......	152.00	......	......	......	......	27.75	45.00	32.00	31.00	.....
Denver	......	......	......	......	......	......	36.00	41.00	34.80bb	28.00bb	34.00bb
Detroit	213.00	226.00	425.00	......	620.00	710.00	41.00cc	40.50cc	36.00	32.00	.....
Kansas City	127.50	147.50	270.00	270.00	340.00	400.00	29.25	29.25	32.00	27.50	28.50
Los Angeles	r	r	r	r	r	r	27.50§	.....	34.00	34.00	35.00
Minneapolis	185.00p	206.00p	422.00p	206.00pw	......	......	43.00•p	50.00	44.00bbe	34.00bbe	46.00bbde
Montreal	164.00aq	178.00au	325.00au	270.00	288.00	......	39.50	46.00	39.20	22.00	13.75u
New Orleans	180.00	180.00	340.00	380.00	......	......	35.00	35.00	30.60	21.50	21.50
New York	158.10h	168.60h	231.70ch	255.20hn	......	......	44.00	.....	37.00	35.00	.....
Philadelphia	156.30	166.80	312.70	375.20	......	......	30/34	34/40	27.60	25.60	3.17
Pittsburgh	154.00	162.00	292.00	340.00	420.00	495.00	36.00	46.00y	32.00	29.50	2.97m
St. Louis	162.00cc	175.00cc	358.00cc	500.00cc	......	621.50	43.00sl	41.50s	.95aa	.80aa	1.55aaepee
San Francisco	156.85a•	177.10a•	235.30dda•	......	......	......	39.50•	39.50•	26.60	26.60	30.50
Seattle	225.00cc	250.00cc	350.00cc	250.00ccw	......	......	43.00s	55.00s	46.00shh	37.50hh	3.90mhh
Toronto	138.70	148.90	273.75	222.00f	......	......	41.50	63.00	40.00	33.50	31.00

•† F.o.b. yard Roxbury. •a Smooth. •b Per 50 lb. bags. •c 6 x 12 x 12 in.-3 cell. •d Pulverized hot. •e 5%, 10th following month. •f 8 x 8 x 12. •g 8½ x 8 x 12. •h F.o.b. trucks, job site N.Y.C. •j Truck load or over. •k $1.00 discount. •l Red face. •m Per bbl., 180 lb. •n 7¾ x 7¾ x 12. Speed title. •p Truck lots. •q Provincial and Municipal tax extra. •r Not used because of earthquake danger. •s 2% discount for cash. •t 5½ x 8 x 11¼. •u Tax exempt. •v Sand lime. •w 8 x 8 x 12. •y Stacked. •z Pebble lime price per 80 lb. sack. •aa Price per sack. Lime not sold per ton. •bb LCL. •cc Truck delivery. •dd 6 x 12 x 12. •ee Pebble lime. •ff 80% common. •gg Rough. $40.00 Smooth. •hh lcl. § F.o.b. yard •** Warehouse delivery. •• F.o.b. plant Stockton.

PAINT, ROOFING—F.O.B. CARLOAD LOTS

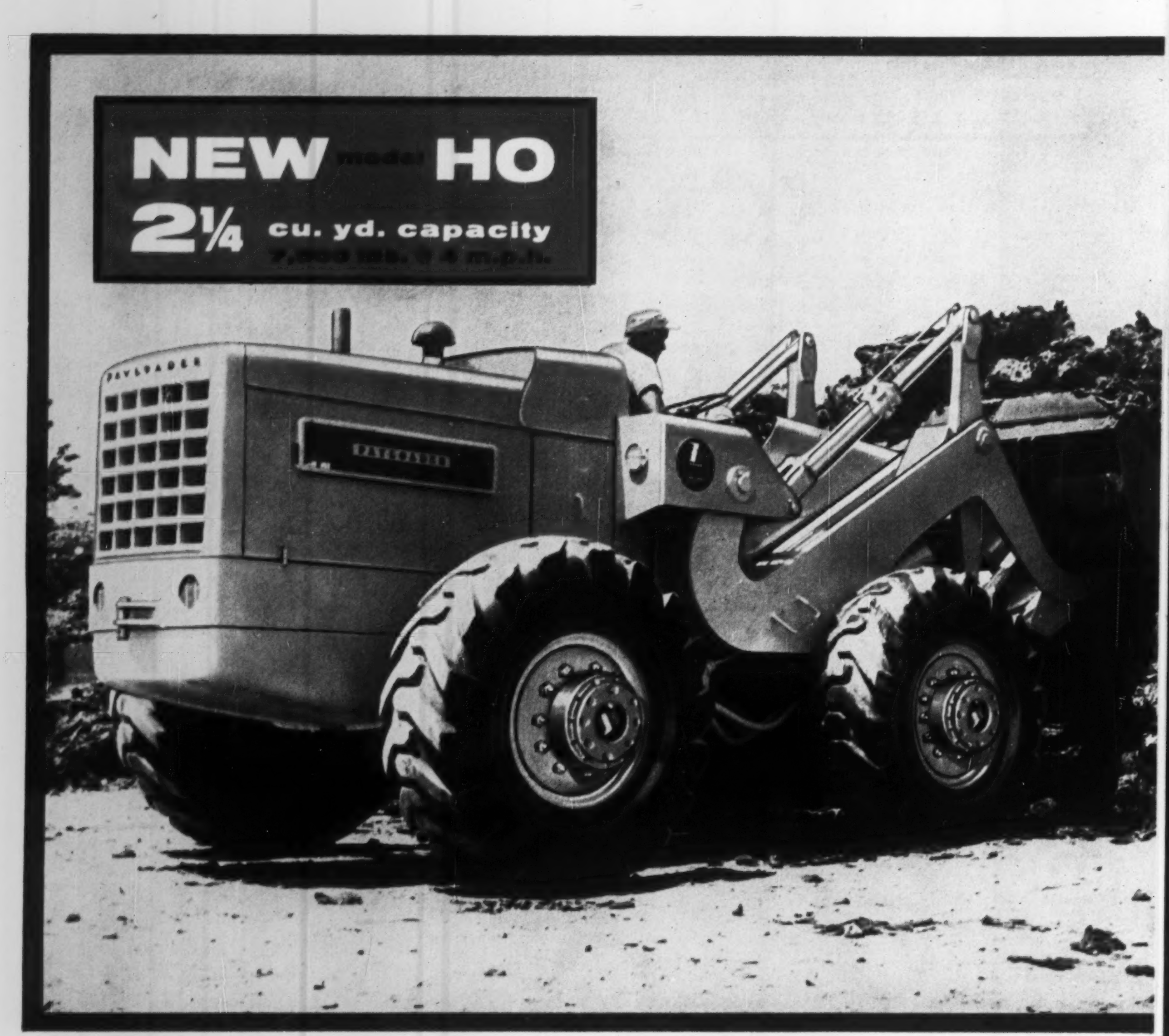
	RED LEAD Per 100 lb. in 600-lb. (Approx.) bbl. Dry a	WHITE LEAD Per 100 lb. in 100 lb. cases In oil w	READY-MIXED PAINT Per gal., drums			ROOFING SUPPLIES; Carload lots f.o.b. factory				
			Graphite b	Aluminum c	Ferric Oxide d	Rolls, slate surfaced, 85–90 lb. per sq.	Asphalt felt, per 100 lb.	Tar felt, per 100 lb.	Asphalt coating per gal.	Tar pitch 360 lb. bbl. per ton
Atlanta	$18.25	$28.275	$3.59	$3.86	$3.31	$3.00	$2.81	$2.81	$0.60	$55.00
Baltimore	18.00	27.90	2.75	4.25	3.35	2.78	4.25	4.25	.48	50.18
Birmingham	18.25	28.275	3.90	3.40	....	3.00	2.55	2.55	.75ff	33.50ee
Boston	18.00	27.90	....	....	....	3.24gq	2.75og	2.75og	.45g	50.50q
Chicago	18.00	27.90	....	....	....	3.40‡u	2.86‡o	2.86‡o	43.50‡bbr	50.50‡
Cincinnati	18.00	27.90	....	....	....	3.00	2.55	2.55	.594y	49.36
Cleveland	18.00	27.90	2.47pgg	2.57gg	2.81gg	3.00q	2.55o	2.55o	.45y	44.00hh
Dallas	18.25	28.65	....	4.05	....	3.50q	3.75o	4.35o	.36	58.50hh
Denver	18.50	28.40	3.29	5.15	3.04	2.70	2.25o	2.25o	.48ff	45.00
Detroit	18.00	27.90	2.35	3.25	2.50	2.53	2.55f	2.55f	.50	46.00
Kansas City	18.00	28.65	3.64	3.12ys	2.76	3.31	3.16o	3.16o	.52	75.91
Los Angeles	18.00	28.15	3.30n	4.50n	4.20n	2.90n	2.05en	l	.64nq	l
Minneapolis	18.00	29.88/28.02	....	....	....	2.70dd	2.295hidd	2.295hidd	.46idd	46.00v
Montreal	......	21.95	4.65Dff	5.60Eff	4.30Fff	....	....	....	....	....
New York	18.00	27.90	....‡	....	....	2.70G	2.30Go	2.30Go	.463Gs	46.00•
Philadelphia	18.00	27.90	3.60	3.40/3.65	3.50/4.60	2.54	2.94	2.94	.37	26.00
Pittsburgh	18.00	27.90	3.10	3.36	3.68	2.72	2.60o	2.60o	.42	52.00
St. Louis	18.00	27.90	....	....	....	2.70	2.30h	2.30h	.52y	51.25
San Francisco	18.00	28.15	2.95	4.15	3.40	2.62	1.75••	....	.44	....
Seattle	18.00	28.40	3.30mcc	4.02mcc	....	3.42mqcc	2.91hmcc	....	.52mcc	52.00mcc
Toronto	......	......	....	....	....	4.45	4.10	....	1.60	80.00

•‡ Delivered. • Note: Red lead in oil 50¢ higher than white lead in oil. •a Red lead prices change frequently due to pig lead price changes. •b U. S. War Dept. Spec. 3-49A. •c ASTM Spec. D266-31. •d 80% minimum ferric oxide. •e 15 lb. •f Per 432 sq. ft. •g F.o.b. yard, Roxbury. •h Per roll, 65 lb. •i Net carload lot prices; Minneapolis and vicinity. •k Per cwt. •l Not used. •m 1% discount for cash. •n F.o.b. city. •o Per 60-lb. roll. •p 6-drum. 50 gal. ea. •q Per 90-lb. roll. •r F.o.b. factory, Chicago. •s 466 Med. •t Federal tax included, add 5% mun. & prov. tax. •u Per 90-lb. square. •v Per ton. •w Price to large paint contractors is $1.25 less •x Mineral surfaced. •y 55-gallon container. •z Drums. •aa 15, /324 sq ft roll •bb Roofers coating and cement; Price per ton. •cc LCL, truck delivery. •dd 2% cash discount. •ee Asphalt pitch in 100 lb. package. •ff 5-gal. drums. •gg F.o.b. factory. •hh Incl. freight. •D Std. Black. •E Ready-mixed. •F Over 80% ferric oxide. •• Aver. wt. approx. 425 to 550 lbs. drums. •G fob factory points

PLASTER, VERMICULITE AND METAL BUILDING SHEETS & TUBING

	PLASTER†		VERMICULITE†				ALUMINUM SHEETh		STAINLESS STEEL SHEET•-TYPE 302g		COPPER WATER TUBING-TYPE L 2000 ft lots per fta	
			Home Insulation pellets	Plaster aggregate	Concrete AGGREGATEl Treated	Concrete AGGREGATEl Untreated	Flati .102" th 36"x96" & 48"x144" per lbt	Corr roof .032" th 36"x12" per shu	20 ga 48"x96-120" per cwthh	26 ga 36"x120" per cwtmm		
	Neat per ton	Gauging per ton	per bag of 4 cu ft								⅝"b	½"c
Atlanta	$32.50	$39.00	$1.55•	$1.65•	$1.80•	....	$0.359n	$9.04n	$53.68•	$61.18•	$20.23f	$28.47f
Baltimore	24.10	34.50	0.95	1.15		$1.15	0.391	0.427r	56.25	64.25	0.21	0.30
Birmingham	38.00	43.00	1.55	1.55	1.80	....	0.437	9.07	55.68	65.68	0.2295	0.3230
Boston	22.00	29.00	1.15/1.20	1.18/1.23		1.30	0.44p	26.15op	55.88dd	61.655ddff	0.1951	0.2745
Chicago	26.80	26.80	1.55	1.60	1.60	....	0.43o	8.892#p	57.55#ee	65.55#ee	0.2023	0.2847
Cincinnati	21.60*•	21.60*•	1.75	1.75	1.85	1.75	0.400	8.66	57.80	69.30ff	0.1881	0.2644
Cleveland	27.50	43.00	1.12	1.16	1.24	....	0.415aa	8.66	57.81	65.81	22.95f	32.30f
Dallas	29.80	31.80	1.20	1.25	1.30	....	0.379	0.439r	55.00	63.10	0.1449	0.2029
Denver	25.00	25.00	1.45	1.35		1.50	0.437	8.89	57.67gg	67.87gg	0.2214	0.3114
Detroit	25.00	25.00	1.50	1.50	1.60	1.60	0.43	8.892	57.80	65.80	22.51foo	32.30f
Kansas City	30.00	35.00	1.20	1.30	1.40	....	0.416	9.94	60.72ee	68.72ee	22.95f	32.30f
Los Angeles	26.20	27.20	1.25ii	1.20ii	1.45ii	1.25ii	0.44	8.14	58.00	66.00	0.2295	0.3230
Minneapolis	32.00	31.00	1.50	1.60	....	1.80	0.43	7.85	56.45	64.20ff	0.2023d	0.2847
Montreal	28.80	33.20	1.10	1.30	1.35	1.30	0.372	8.25	62.75	....	0.26	0.320
New Orleans	35.00	40.00	1.50	1.20	1.25	1.25	0.388	0.366aabb	58.18	66.18	0.2134	0.2999
New York	24.00	30.00	1.25	1.20	1.40	1.30	0.445#o	8.72#	58.48	66.48	19.87f	27.96f
Philadelphia	23/25	32.00	1.35	1.35	1.35	1.40	26.50#wz	7.55#	53.23#	60.98#	18.57f	26.09f
Pittsburgh	27.50	31.00	1.30	1.30	1.37	1.32	0.42	9.19	56.81	62.63	0.2045	0.2572
St. Louis	31.00	40.00	1.30	1.55jj	1.60jj	1.50	0.45io	8.89e	56.79kk	75.79kk	22.95fm	32.30fm
San Francisco	27.85	27.85	1.05	1.05	....	1.24	0.44	8.45cc	64.40	72.40	0.2023	0.2847
Seattle	33.00	36.50	1.45	1.25k	1.85	....	0.388	7.589	60.50ee	68.00ee	0.2023	0.2847
Toronto	30.00	45.00	1.20	1.30	1.45	1.35	0.394	21.55	58.80	92.40	0.3289pp	0.4136pp

† trucklots, delivered * carload # delivered •a fob city •b ½" O.D. •c ⅝" O.D. •e 2-10M ft; 10M ft & up: $0.1925/ft •f per 100 ft •g 5 tons & up; cold roll, anneal & pickled; 2B finish •h 15M lb •i 3003 alloy; 1100 alloy: $0.456/lb •j 1100 & 3003 alloy, mill finish •k per bag of 3 cu ft •l treated has air entraining agent; untreated does not •m 2-10M ft •n fob plant, fr allow •o 5M lb & up •p 100 sq ft quantity •q 2M lb quantity •r per lb •s 30# bag •t 36" x 96; 10.81 lb/sh; 48" x 144":21.7 lb/sh •u 19.31 lb/sh •w 48" x 144" •x 36" x 96" $13.25/sh •aa 16M lb & up •bb fob mill •cc 26" x 6-12' •dd add $0.75/cwt for boxing •ee 4 tons & up •ff 26 ga •gg add $2/cwt boxing; $0.75/cwt on skids •hh Theoretical wt for 48" x 96"; 50.4-lb, per sh. •ii 300-bag lots •jj per 100-lb bag •kk mill shipment; add $2 per cwt for immediate del •mm Theoretical wt: 19.7-lb per sh •nn Deliv. warehouse means •oo ¼" O.D. •pp Incl 10% sales tax



Bigger Capacity...

This new, 1956 model HO "PAYLOADER" has a bucket capacity of 2¼ cu. yd. payload, 1¾ cu. yd. struck . . . is the biggest-capacity "PAYLOADER" ever offered, and outstanding by any measure. Pound for pound, it's ahead of the field in digging power and carrying capacity. It's more maneuverable, faster operating, easier operating, easier riding—with or without a load—than anything near its size. It delivers better, more reliable traction over a wider range of ground conditions than any wheeled tractor-shovel *ever* has. It has balanced design and durability *throughout* to deliver big yardage day after day without interruption.

HOUGH Design . . Quality . . Value

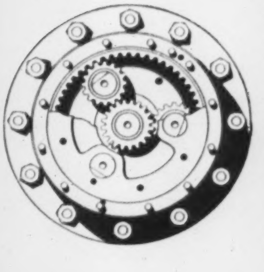
Digging power: Pound for pound, this "PAYLOADER" has more traction and digging power—for a wider range of ground conditions—than any wheeled tractor-shovel ever built.

Hydraulic shock absorber: A shock absorber in the hydraulic system smooths out the ride, permits faster load-carrying speeds over rough terrain—with less spillage.

More production, less effort: Power-steer, power brakes (on all 4 wheels), power shift (no "clutching") and good riding qualities also lessen operator fatigue—promote full production all day.

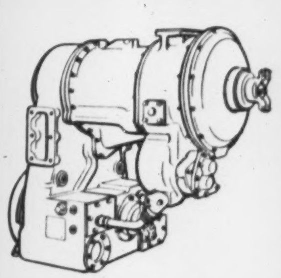
"Stay-clean" hydraulic system: The hydraulic system is closed and pressure-controlled to keep air and dirt from being sucked into the system. This reduces oil foaming, lessens trouble and increases the life of pump, valves, cylinders, rod packings. Both boom and bucket rams are located so as to minimize their exposure to dirt and damage.

Accessible: Unusual accessibility for servicing and maintenance is built into this "PAYLOADER." Battery and oil reservoir are located under an easy-access cover just behind driver's seat. Easy access to engine is possible from either side—and not hindered by boom arms or other structure. "Pick-off" outlet is provided for the easy addition of hydraulically-operated accessories.



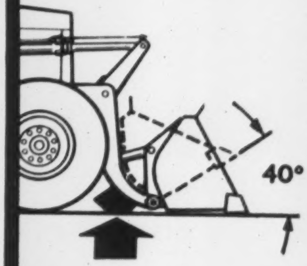
Long-life, high-traction drive train

Heavy duty planetary final drives in the wheel hubs, and hypoid differential gearing, keep torque low in axles . . . prolong life of axles and *all* drive train parts. More effective traction is assured by the use of the model HO torque-proportioning differentials. If one wheel starts to slip, more power is delivered to the opposite wheel. The wheel with the better traction automatically gets up to 24% more torque.



Complete power-shift transmission

The easiest-acting, most effective transmission ever built into a tractor-shovel. *All Shifts* up or down can be made instantly, on-the-go under full engine speed. There's no foot clutch, no stopping for a RANGE shift. The forward-reverse control can also be operated under full engine speed, in any gear, while retaining full bucket action . . . all this, plus torque-converter drive.



Tremendous pry-out action and 40° tip-back at ground level

Special pads are provided on the bottom of the boom arms to give ground support for powerful pry-out action. Load forces are also absorbed by the pads, relieving the axles and wheels of these strains. The bucket can tip back 40 degrees, before raising, to get heaped loads quick and easy even in shallow cuts and low piles, and to retain heaped loads.

Better Performance

If you want the last word in tractor-shovel workability on your jobs, you'll want this husky HO "PAYLOADER". Your Hough Distributor is ready to give you full information.

PAYLOADER®
MANUFACTURED BY
THE FRANK G. HOUGH CO. LIBERTYVILLE, ILL.
SUBSIDIARY—INTERNATIONAL HARVESTER COMPANY

THE FRANK G. HOUGH CO.
772 Sunnyside Ave., Libertyville, Ill.

Send full information on "PAYLOADER" 4-wheel-drive tractor-shovels

☐ model HO—2¼ cu. yd. ☐ model HH—1½ cu. yd. ☐ model HU—1 cu. yd.

Name____________________

Title____________________

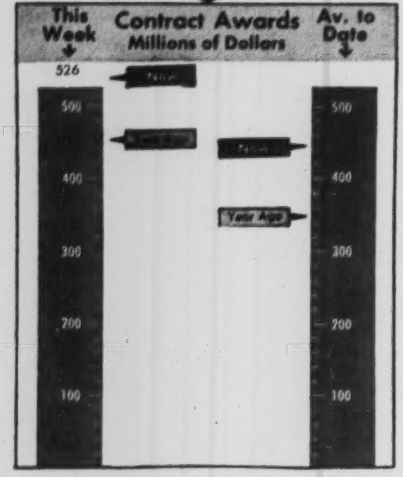
Company____________________

Street____________________

City__________ State__________

Construction Scoreboard

Activity this Week



AMOUNT OF CONTRACTS LET

By Ownership	This Week	Cum. 17 wks 1956	Chge %
	$ millions		
Federal	$14.6	$578.6	+5
State and Municipal	163.7	2,033.0	+26
Total Public	178.3	2,611.6	+21
Total Private	347.7	5,010.3	+37
U. S. Total	$526.0	$7,621.9	+31
By Type of Work			
Waterworks	$9.3	$100.2	+18
Sewerage	16.6	215.3	+65
Bridges	20.8	193.5	+27
Highways	61.1	739.4	+20
Earthwork, Waterways	11.2	215.0	+52
Buildings:			
Public, Excl. Hsg.	17.7	619.0	+13
Public Housing	26.6	132.2	+56
Private Housing	137.1	2,161.5	+1
Commercial	46.3	673.5	+30
Industrial	151.1	1,922.8	+147
Unclassified	28.2	649.5	+6
U. S. Total	$526.0	$7,621.9	+31

NOTE: Minimum size projects included are: Waterworks and waterways, $44,000; other public works, $73,000; industrial buildings, $93,000; other buildings, $344,000.

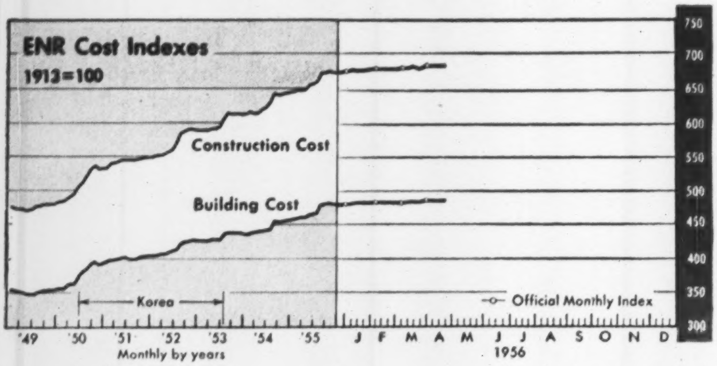
NEW CAPITAL FOR CONSTRUCTION

	Week of Apr. 19	Cum. 16 wks 1956	Chge '55-'56 %
	$ millions		
Corporate Securities	$103.1	$995.1	+8
State and Municipal:			
All Except Housing	78.6	1,417.2	+16
Housing	...	20.3	−56
Federal Loans	2.2	36.4	+39
Federal Aid	...	...	...
Total Nonfederal	$183.9	$2,469.1	+11
Federal Appropriations:			
In U. S.	...	$34.4	...
Outside U. S.	...	...	...
Total New Capital	$183.9	$2,503.5	+13

Cost Indexes as of Now

ENR INDEXES (1913=100), 20-cities' average	April 19 1956	Percent Change from last Month	Year
Construction Cost	683.37	+0.2	+5.2
Building Cost	485.93	+0.3	+5.2

To convert above indexes to 1926=100: Divide Construction Cost by 2.080; Building Cost by 1.845.
1949=100: Divide Construction Cost by 4.770; Building Cost by 3.518.

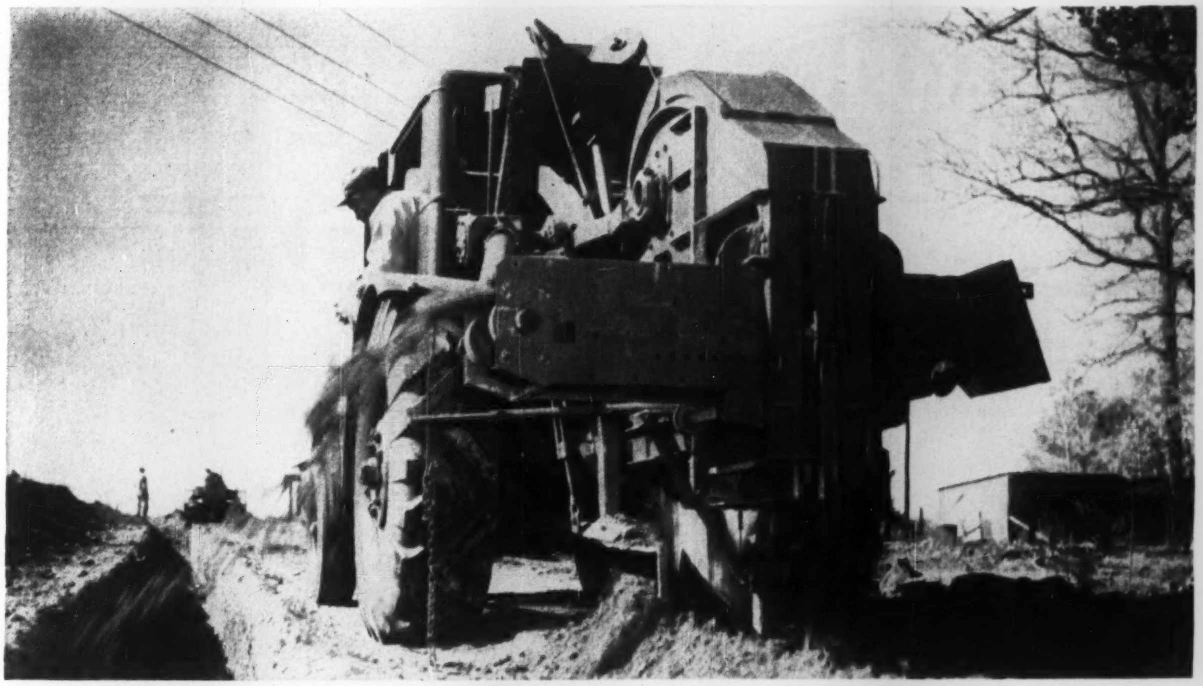


HEAVY CONSTRUCTION BACKLOG Millions of dollars	Mar. 31 1956	Percent Change from last Month	Year
Total U. S. (ENR reported)	$97,752	+1.3	+18.4
By Ownership—			
Private	41,163	+1.4	+21.2
State & Municipal	43,729	+1.4	+20.1
Federal	12,860	+0.8	+ 5.4
By Type of Work—			
Waterworks	2,050	+0.7	+24.4
Sewerage	3,018	+1.0	+ 4.3
Bridges	2,828	+1.8	+ 8.1
Highways	11,531	+1.1	+17.1
Earthwork, Waterways	11,377	+0.9	+19.3
Public Buildings	17,166	+2.1	+11.3
Industrial Buildings	15,457	+1.3	+29.2
Commercial Buildings	16,364	+1.6	+21.5
Unclassified, Private	9,342*	+1.0	+10.7
Unclassified, Public	8,619	+0.2	+29.5
By Regions—			
New England	$5,263	+2.5	+ 4.9
Middle Atlantic	26,407	+1.3	+14.1
South	11,673	−0.2	+16.2
Middle West	17,468	+2.5	+20.7
West of the Mississippi	22,683	+1.1	+11.4
Far West	20,258	+1.1	+36.8

* Includes private bridges, $81 millio

FLOW OF NEW PROJECTS INTO THE BACKLOG Millions of dollars	1956 Mar.	3-Months	Percent Change from '55 Mar.	Year-Cum.
Total U. S. (ENR reported)	$2,707	$8,018	− 4	+ 41
By Ownership—				
Private	1,487	3,888	+ 39	+ 64
State & Municipal	998	3,623	− 42	+ 12
Federal	222	507	+415	+385
By Type of Work—				
Waterworks	32	114	+ 50	+ 71
Sewerage	66	123	+153	+115
Bridges	65	180	+351	− 57
Highways	145	284	− 88	− 81
Earthwork, Waterways	199	371	+5,552	+ 44
Public Buildings	614	1,435	+ 77	+ 82
Industrial Buildings	743	1,923	+ 75	+147
Commercial: Mass Housing	333	862	+ 27	+ 11
Other Building	256	702	− 7	+ 19
Unclassified, Private	155**	401**	+ 44	+ 78
Unclassified, Public	99	1,623	− 31	+586

** Includes private bridges, $3 million

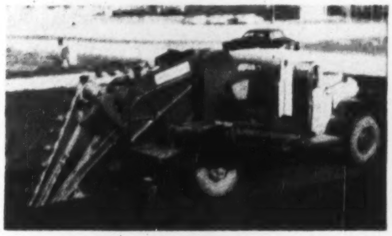


Model 705 Barber-Greene Runabout digs through toughest soils. High travel speed cuts time and cost of service trenching.

For lowest-cost trenching . . . choose the ditcher that's right for you

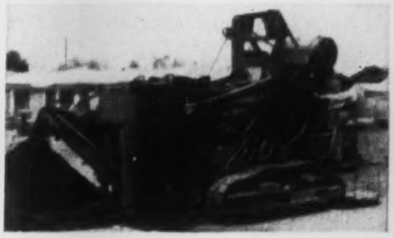
The first step in reducing ditching costs is to select the machine that meets your requirements. Ground conditions . . . digging range . . . job to job portability —all are factors that change with varying trenching operations. That's why Barber-Greene builds *four* distinctively different ditchers—each with special features that give it unsurpassed performance within its field.

Take the Model 705B Runabout for instance. Long a favorite for house service trenching, this versatile ditcher features the exclusive vertical boom that digs right up to obstacles leaving no ramp . . . Hydra-Crowd that gives finger-tip control of maximum crowding speeds independent of bucket line speed . . . and Fluid Coupling that eliminates shock loads.



Model 711 for widely scattered jobs. A 45 m.p.h. travel speed reduces between job time to a minimum. Digs to 5′ deep, and 18″ wide.

Model 702 for narrow trenches. A remarkably low-cost unit ideal for cable, conduit or small pipe. Digs 2¼″ to 5″ wide, to 40″ deep.



Model 44C for heavy-duty trenching. Crawler mounted for sure traction on soft bases, this Barber-Greene cuts to 8′ 3″ deep, and to 24″ wide.

56-4-D

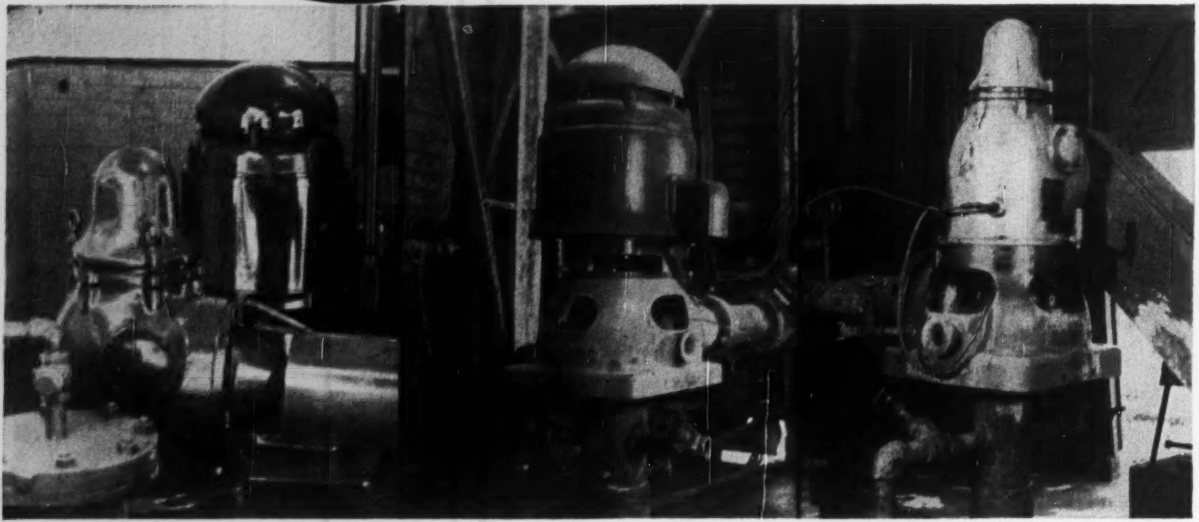
Write for literature on any ditcher in the Barber-Greene line

Barber-Greene

AURORA, ILLINOIS, U.S.A.

CONVEYORS . . . LOADERS . . . DITCHERS . . . ASPHALT PAVING EQUIPMENT

PEERLESS PUMPS ON THE LINE



FOR *Fire*... FOR *Water*... FOR *Brine*...

MORTON SALT "WHEN IT RAINS—IT POURS"

HERE IS INSTALLATION VERSATILITY AVAILABLE ONLY WITH VERTICAL PUMPS

MORTON SALT COMPANY, RITTMAN OHIO PLANT, USES PEERLESS VERTICAL PUMPS FOR ALL 3 IMPORTANT PLANT DUTIES

They supply all the water for the plant—

They provide approved fire protection—

They pump the salt wells . . .

Here's what U. J. Grant, Morton Salt Rittman, Ohio Works Engineer, says about Peerless vertical pump operation costs. On the particularly *tough* service of pumping brine, he states, "we recently repaired an 8" deep well Peerless pumping unit installed in our No. 19 salt well. This unit was installed in 1949. The original pump bowl assembly was apparently in good condition and was put back in the well. Considering this unit is rated at 400 gpm with more than 5 years operation we are well within my estimate that upkeep costs are one cent or less per 1000 gallons of brine pumped. This cost applies to the small Peerless pumps we also use!"

Verified low Peerless maintenance costs on tough service like pumping salt wells points up how inexpensive it is to put the *economical* versatility of Peerless vertical pumps to work for you. Use the coupon for information about the VERTICAL VERSATILITY of Peerless industrial service pumps.

MORTON SALT KNOWS WHAT VERTICAL VERSATILITY MEANS!

PEERLESS PUMP DIVISION
FOOD MACHINERY AND CHEMICAL CORPORATION
301 WEST AVENUE 26, LOS ANGELES 31, CALIFORNIA

PEERLESS PUMPS fmc FOOD MACHINERY AND CHEMICAL CORPORATION

Factories: Los Angeles 31, California and Indianapolis 8, Indiana

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ENR

Construction demand outruns supply as . . .

Aluminum Shortage Develops

The record-shattering volume of construction is sparking a fast rise in demand for aluminum this year—and it is adding some aluminum building products to the shortage list.

Construction activity has a major effect on aluminum demand because the construction industry is the largest single buyer of wrought aluminum (excludes castings). The most recent figures available show that in the second half of 1955, construction received directly 20.2% of the total shipments. In addition, construction buys from distributors and jobbers (who acaccounted for an additional 15.3% of the shipments in second half of '55).

Although producers and fabricators have been increasing output rapidly, demand continues ahead of supply.

The booming demand for aluminum shows up in first quarter sales of the major producers. Reynolds Metals reports that its first quarter sales climbed 20% above the first three months of '55. Kaiser Aluminum & Chemical's sales were up 20% over year-ago figures for the three months ended Feb. 29. And, the "daddy of them all"—Alcoa—chalked up an 11% increase in first quarter sales this year over the same period in '55. (Total 1955 sales for Alcoa ran 19% above 1954.)

• Shipments up 20%—While demand has been climbing, shipments also have risen substantially. Total mill shipments of aluminum products added up to 241,000,000 lb in the first two months of '56, according to Department of Commerce. That's 20% ahead of same period last year.

While the total shipment figure is impressive, gains have been as great—or greater—for the aluminum products that construction uses. For example, shipments of non-heat treatable sheet and plate were up 27% in the first two months of this year in comparison with 1955. Shipments of soft alloy extruded shapes, for which construction is a prime customer, were 24% ahead of the comparable 1955 period, and there was a 23% increase in shipments of aluminum wire and cable.

• Building sheets are short—Despite the fast rise in shipments, shortages of aluminum building sheets have developed in Boston, Denver, Detroit, Kansas City, Mo., New Orleans, and elsewhere. Deliveries take 90 days or more in these cities. San Francisco has reported a "slight shortage" of aluminum building sheets, with deliveries taking 60 to 90 days.

All three of the major producers have launched major expansion programs in an attempt to catch up with demand. Some of these expansion moves go well beyond company capacity goals set as recently as last summer (ENR Aug. 18, 1955, p. 22).

Alcoa has just awarded a construction contract for a 150,000-ton smelter at Boonville, Ind., near Evansville, to cost an estimated $80 million. This facility is expected to go into production during the fall of 1957.

Reynolds is adding 100,000 tons of primary aluminum reduction facilities and will enlarge its sheet rolling mill at Sheffield, Ala. Also, Reynolds is expanding the capacity of its Corpus Christi, Texas, alumina plant by 50%.

Kaiser is spending about $178 million in an expansion program scheduled for completion by 1958. This program includes a reduction mill at Ravenswood, W. Va., with 125,000 tons of primary aluminum capacity; additional primary capacity at its Chalmette plant; a new alumina plant on the Mississippi River at an undisclosed Louisiana site; and additional fabricating facilities at other locations.

With these expansion programs in mind, Alcoa's President I. W. Wilson last week predicted that "it will not be too long" before aluminum supply will match demand, "bringing about keen competition."

Wilson said supplies of aluminum would improve because of higher production of aluminum and smaller shipments to the defense stockpile. When demand and supply get back in balance again, Wilson predicted the producers would devote more attention to developing new markets, to keep demand strong.

Wilson—and other aluminum officials—are counting heavily on less government stockpiling of aluminum. How much aluminum is headed for the government stockpile this year is an important—and, as yet unanswered question.

When the demand for aluminum surged ahead of supply last year, industry officials urged the government to reduce its defense inventory requirements, at least temporarily, so that more aluminum could be shipped to civilian customers. Sympathetic defense officials deferred a scheduled shipment of 200,000 tons of aluminum into the stockpile and permitted the metal to go into commercial channels instead.

If the inventory requirements are realistic, however, there is obviously a limit to the number of times that the government can be asked to stay out of the market. The best that can be expected on this score is that stockpile shipments will be reduced for another six or nine months to permit rising production to come closer to current demand.

Mortgage Support

Fannie Mae's purchase of insured home loans sets quarterly record

Homebuilding and the mortgage market received a much-needed helping hand during the first quarter, when the Federal National Mortgage Assn. purchases of government-insured FHA and VA home loans set a new three-month record.

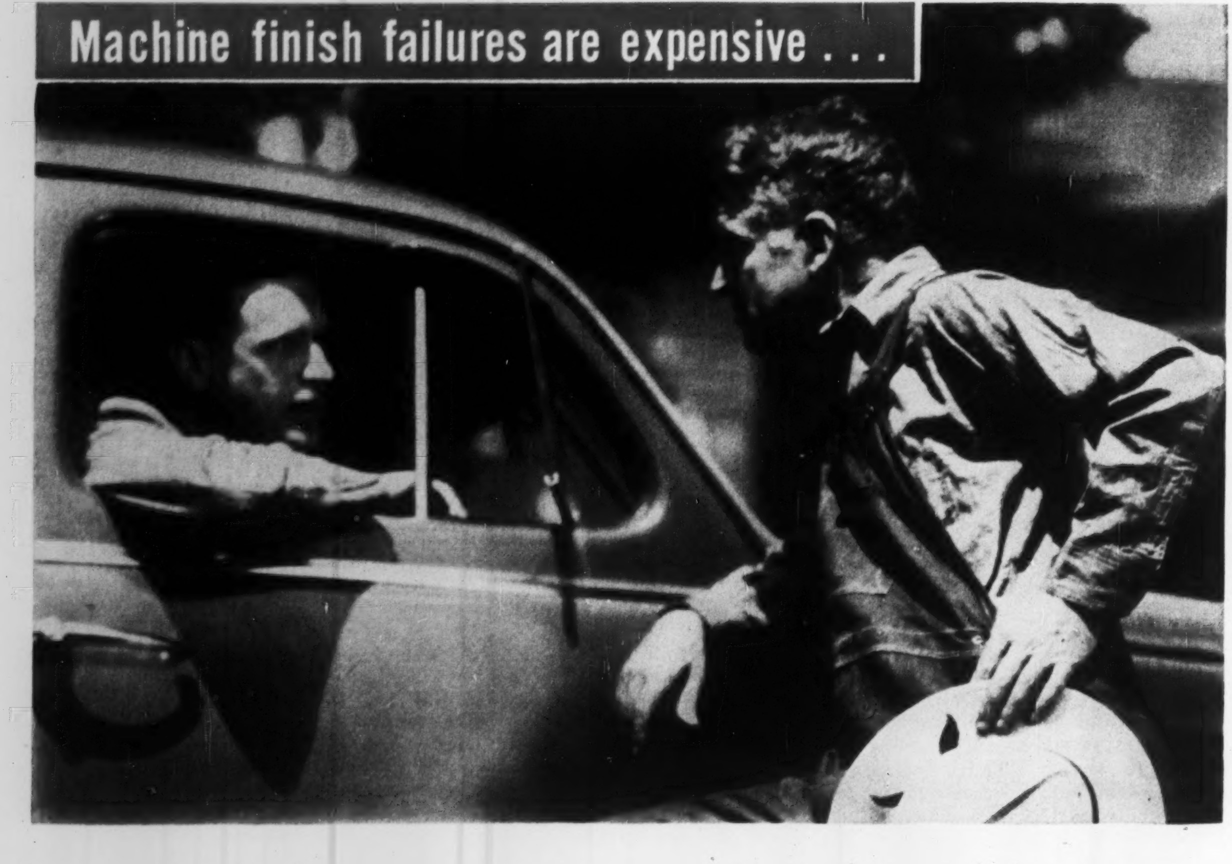
Although Fannie Mae's Secondary Market Operations moved along at a brisk pace in the last quarter of '55, the first quarter of this year topped the earlier period by 28% in dollar value of mortgages purchased. The reason for the upswing in Fannie Mae's mortgage-buying is no secret. Money is "tight" now and it has been since last fall.

Commenting on this, J. Stanley Baughman, FNMA president, said: "There undoubtedly are localities where residential mortgage funds are easing somewhat, but taking the country as a whole . . . it appears that the money market is still tight in a great many areas—particularly in smaller communities located some distance from the larger metropolitan and financial centers."

Baughman pointed out that the marked upsurge in mortgage buying which started last December has continued at a consistently high pace. Although Fannie Mae has acquired a total of $170 million in mortgages since it started its Secondary Market Operations 17 months ago, it is only in recent months that it has been a significant factor. Of the $156 million in mortgages now held by Fannie Mae, $100 million worth have been acquired just in the past four months.

(B&F continued on page 115)

Machine finish failures are expensive . . .



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18,000,000 Homes Can Be Sold

Nearly 18,000,000 Korean and World War II veterans still have their home loan rights intact and unused. This huge reservoir of potential home buyers blankets the entire country, but the depth of the untapped market varies markedly from area to area, according to the latest Veterans Administration reports.

Overall, only about 21% of the more than 22,000,000 eligible veterans have used the GI home loans to which they are entitled. In some areas, only a comparative handful of veterans have purchased homes with VA-guaranteed loans, while in other regions, veterans have made liberal use of the program.

On a regional basis—comparing the more than sixty regions in which the VA maintains field offices—the percentage of veterans who have used GI home loans ranges from a high of 38.5% in Delaware to a low of 6.9% in North Dakota.

Striking differences turn up when metropolitan areas are compared with smaller communities and with rural counties. Most of the VA-guaranteed home loans have gone to veterans living in cities. Some 3,500,000 GI home loans have been accounted for by the 282 counties classed as metropolitan by the Census Bureau. More than 28% of the veterans living in these big-city areas have used their loan privileges.

Veterans living in the nation's 2,644 small, non-metropolitan counties—containing no city as large as 25,000 population—have not been as quick as their city counterparts to take advantage of VA loans with smaller down payment requirements and lower interest rates. Only 11% of the eligible veterans in these rural areas have bought homes with GI loans.

Not only does the use of the program vary from city to rural area, but even from city to city. Only 11.5% of the veterans in the Chicago metropolitan area have used their home loan benefits, while New York's figure is 21.8%, and Wichita, Kan., shows that 56% of those eligible have used this financing.

In general, GI loans have been used most in the fast-growing West Coast and Southwest areas. In some cases, GI home loans have financed 40% to 50% of the new home built in these areas in recent years.

Obviously, even these areas still offer a market potential for homebuilders. But the big market is still ahead—if the flow of mortgage money into small towns and rural areas improves, and discounting of VA mortgages is minimized.

Congress also plays a part in how far the remainder of the market can be developed. Of the 18,000,000 veterans presently entitled to GI home loans, more than 11,000,000 are veterans of World War II. Unless Congress extends the act, these World War II veterans will lose any rights they have not used at the time of the cut-off date—July 25, 1957.

No. of Potential Loans by VA Regions

Togus, Me.	104,771
Manchester, N. H.	61,303
White River Jct., Vt.	37,810
Albany, N. Y.	159,020
Boston, Mass.	477,088
Providence, R. I.	160,222
Hartford, Conn.	256,076
New York, N. Y.	1,235,927
Syracuse, N. Y.	162,484
Buffalo, N. Y.	223,296
Newark, N. J.	577,845
Philadelphia, Pa.	404,461
Wilmington, Del.	29,551
Baltimore, Md.	221,010
Wilkes-Barre, Pa.	341,867
Pittsburgh, Pa.	570,082
Washington, D. C.	157,108
Huntington, W. Va.	233,676
Roanoke, Va.	336,967
Winston-Salem, N. C.	431,341
Columbia, S. C.	209,370
Atlanta, Ga.	323,399
Miami, Fla.	332,249
Montgomery, Ala.	309,692
Nashville, Tenn.	350,375
Louisville, Ky.	323,899
Cincinnati, O.	426,695
Cleveland, O.	560,821
Detroit, Mich.	795,877
Indianapolis, Ind.	417,073
Jackson, Miss.	200,830
New Orleans, La.	184,150
Shreveport, La.	93,403
Little Rock, Ark.	199,343
St. Louis, Mo.	288,880
Chicago, Ill.	1,229,942
Milwaukee, Wis.	390,890
St. Paul, Minn.	321,142
Des Moines, Ia.	277,272
Kansas City, Mo.	226,721
Fargo, N. D.	96,823
Sioux Falls, S. D.	79,355
Lincoln, Neb.	151,217
Wichita, Kan.	175,959
Oklahoma City, Okla.	224,590
Dallas, Tex.	277,271
Waco, Tex.	110,546
Houston, Tex.	172,366
San Antonio, Tex.	161,987
Lubbock, Tex.	128,373
Albuquerque, N. M.	74,083
Denver, Colo.	157,943
Cheyenne, Wyo.	32,673
Ft. Harrison, Mont.	75,168
Boise, Ida.	67,064
Salt Lake City, Utah	81,510
Phoenix, Ariz.	90,181
Los Angeles, Calif.	726,124
Reno, Nev.	25,250
San Francisco, Calif.	543,823
Portland, Ore.	216,828
Seattle, Wash.	252,374
Total	**17,565,436**

THE LONGER LOOK:

Mounting enrollments put New pressure on schools

If—and it is a big "If"—states and cities can find some answers to the riddle of how to finance new school construction at a vastly accelerated rate, the postwar boom in school-building could be dwarfed by a rush of new projects in the next five years, because of mounting enrollments.

Although U. S. school construction in the postwar period from 1946 to the present adds up to a staggering $16 billion worth of work put in place, the job of building enough classrooms looms much larger in the immediate future.

Here are some of the striking trends in school enrollment that turn up in the latest figures comparing 1950 and the current school year:

- Kindergarten enrollment is up from 895,000 to 1,628,000—an increase of 82%.
- Elementary school enrollment is up from 20,511,000 to 24,451,000—an increase of 24%.
- High school enrollment is up from 1950's figure of 6,608,000 to 7,857,000 this year—an increase of 19%.

Even colleges and universities, which went through a temporary slump in enrollments in the early 1950s, now have about 2,700,000 students—2% more than in 1950.

The surge of children into kindergartens and elementary schools is the result of the high birth rates of the postwar years. The effects will be felt

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225 North Temple City Blvd. .. EL MONTE, CALIF.
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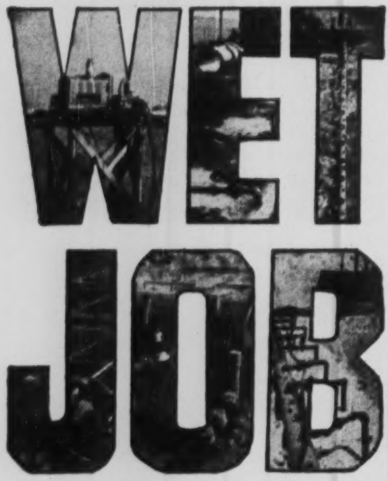

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in higher demand for every type of educational building as the record numbers of kindergarten children enrolled this year advance into elementary school and later into high school and college.

By 1960, enrollment in elementary schools will climb another 21%, in high schools, almost 25%; and in colleges and universities, 19% over 1955 totals, according to projections made by the U. S. Office of Education.

Although kindergarten enrollments are not forecast as easily, enrollments are expected to be up substantially in this category also.

Looking even further ahead, the U. S. Office of Education expects that by 1965, secondary school enrollments will be 60% higher than they are now and that colleges and universities will have 45% more students. Some forecasts put the expected rise in college and university enrollment by 1965 at a level 85% higher than 1955.

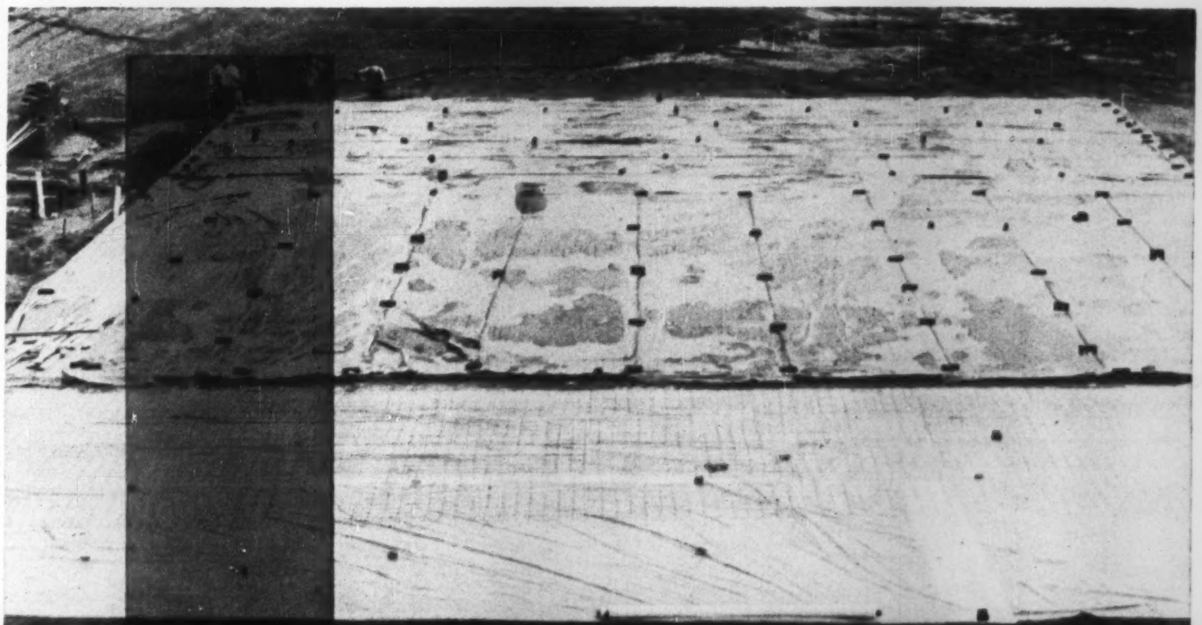
These overall figures on anticipated rise of school-age groups provide only a minimum estimate for school construction. They do not take into account the intensified need for more school buildings caused by shifts of population from cities to suburbs. And, they do not cover the need to replace obsolete facilities and relieve the critical overcrowding that already exists.

It adds up to the biggest school construction boom in history—if the nation, or more specifically, the local school districts—can find the money to pay for it.

Business Briefs . . .

• **Expensive expansion**—As the Chicago District Federal Reserve Bank last week raised its discount rate from 2½% to 2¾%—joining the eleven other reserve banks that had raised their rates the preceding week—there were other signs of the rising cost of borrowing. Southern California Edison Co. had to pay an average interest cost of 3.71% for $40 million worth of construction money raised through the sale of 25-year bonds. It was the costliest borrowing of this type—with one exception—since the early 1930s.

• **Less profit for prefabber**—National Homes Corp., the nation's largest manufacturer of prefabricated houses, earned less money in '55 than in '54, even though sales were up 16%. The firm had sales of $64.8 million and a net profit of $2.1 million. Reason for the profit decline: Cost of National's expansion program and substantial increases in building materials costs.



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BLS Surveys 1955 Wage Gains

Union wage scales in the construction industry rose, on the average, 10 cents an hour during the year ending July 1, 1955, but the annual rate of increase (3.5%) was the lowest since World War II. Typical increases ranged from 5 to 15 cents and the average journeymen's scale for all trades combined climbed to $3.09. Average workweek remained at 39.4 hours.

The figures are based on the 49th annual survey of union scales in the building trades by the U. S. Department of Labor's Bureau of Labor Statistics. Originally reported in the March issue of "Monthly Labor Review", more detailed information on the survey will appear in the forthcoming BLS Bulletin 1192.

The survey covered 680,000 journeymen and 165,000 helpers and laborers in 52 cities with a population of 100,000 or more, and reflects minimum wage scales achieved through collective bargaining. Here are some of the things the survey discloses:

- For most of the trades, hourly rates advanced 8 to 11 cents. Increases typically varied from 5 to 15 cents. Nearly one-fifth of the workers were boosted 15 to 20 cents.
- On July 1, union scales averaged $2.90 for all construction workers, $3.09 for journeymen and $2.16 for helpers and laborers. Nearly three-fifths of all journeymen were receiving rates of $2.80 to $3.30. Average journeymen rates exceeded $3.00 in 18 trades.
- Journeymen rates ranged from a low of $1.65 for glaziers in Charlotte, N.C., to $4.05 for some classifications of operating engineers in New York City.
- Highest paid of the crafts were bricklayers with an average journeymen rate of $3.48; glaziers were lowest at $2.77; plasterers, stonemasons and lathers averaged better than $3.25; paperhangers and composition roofers trailed with the glaziers at less than $2.90.
- Lower paid workers generally received the larger gains. Helpers and laborers had an average increase of 4.3%, with those in the marble setting and tile laying trades exceeding 5%. Average increase for journeymen was 3.4%.
- Helpers and laborers ranged in scale from $1.96 for composition roofing to $2.45 for plaster and terrazzo work; 59% were in the $2.00 to $2.50 rate range, and building laborers averaged $2.07 an hour.
- On a regional basis, average journeymen hourly wage increases were generally uniform, ranging from 9 to 10½ cents, except in the Mountain and New England states where they were 6 and 12 cents respectively. As indicated in the chart below, average union scales in the building trades were highest in the Middle Atlantic and lowest in the Southeast states:

Region	All trades	Journeymen	Helpers and laborers
United States	$2.90	$3.09	$2.16
New England	2.71	2.93	2.09
Middle Atlantic	3.16	3.37	2.38
Border States	2.72	3.01	1.86
Southeast	2.40	2.71	1.47
Great Lakes	3.01	3.16	2.36
Middle West	2.88	3.03	2.20
Southwest	2.57	2.83	1.49
Mountain	2.61	2.83	2.00
Pacific	2.85	2.96	2.25

- Average workweek for the building trades remained at 39.4 hours. The predominant standard workweek was 40 hours. A 35-hour week applied to 1 out of 8 journeymen and 1 out of 12 laborers and helpers, including at least a fifth of the bricklayers, painters, and bricklayers' tenders. Less than a fifth of the plasterers reported a negotiated 30-hour week.
- The proportion of workers covered by health, insurance and pension plans increased only slightly. Health and insurance plans, for the most part financed entirely by employers, covered about three-fifths of the workers, but less than one-fifth had the benefit of pension plans. Trades having negotiated health and insurance plans included asbestos workers, boilermakers, painters, pipefitters, plumbers, sheet metal workers and structural iron workers. Although electricians headed the list on pension plans, lathers, pipefitters, plasterers, plumbers, sheet metal workers, and bricklayers' tenders reported substantial coverage in this category.

Wage Rates: Steady Climb

BLS indexes of union hourly wages in the building trades (average 1947–49=100)

Date	All trades	Journeymen	Helpers and laborers
1920–May 15	43.6	44.7	38.1
1926–May 15	55.0	56.6	45.2
1931–May 15	60.6	62.4	49.4
1933–May 15	50.3	51.9	40.3
1940–June 1	63.3	64.7	54.3
1946–July 1	80.5	80.9	77.9
1950–July 1	110.7	110.5	112.2
1954–July 1	136.4	135.4	142.4
1955–July 1	141.2	140.0	148.5

Monopoly and Labor

NAM suggests Congress reexamine antitrust laws

The National Association of Manufacturers last week said the "time is long overdue for the Congress to make a searching examination with a view to determining how and to what extent monopolistic practices by labor unions should be regulated and controlled in the public interest."

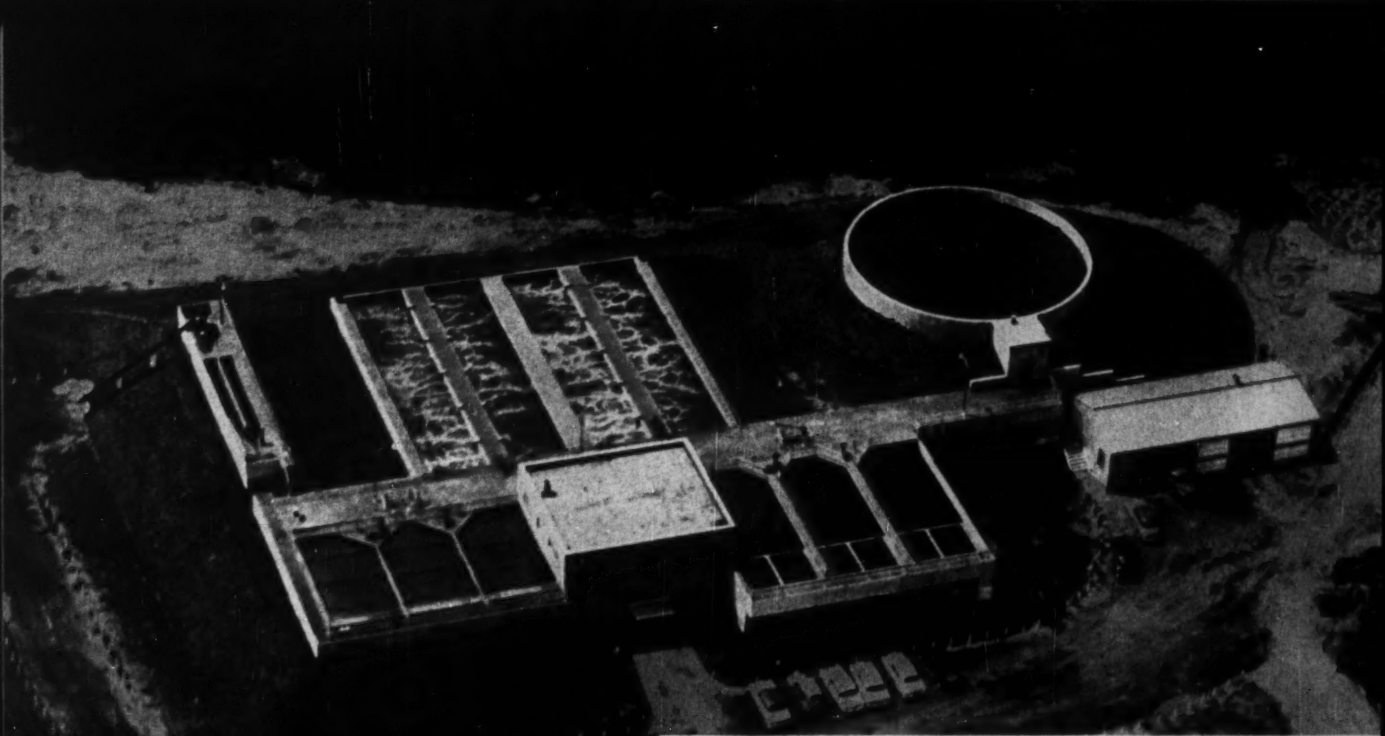
In a report released on Tuesday, NAM said the courts have held that existing antitrust laws do not apply to labor unions and that the Taft-Hartley Act contains only "a few modest restrictions on certain types of union activities." The result, it claims, is a "double standard" in the application of antitrust laws—one for business and one for labor.

• NAM position—According to NAM, there is a "widespread feeling that organized labor is one of the strongest economic forces in the United States today." It asserts that existing laws, administrative rulings and court decisions have permitted labor to enjoy a "monopoly power," which is exercised, not by local unions, but by a combination of unions. Thus the root of the problem, it claims, is the "power and dominance of the national or international union over its local constituents."

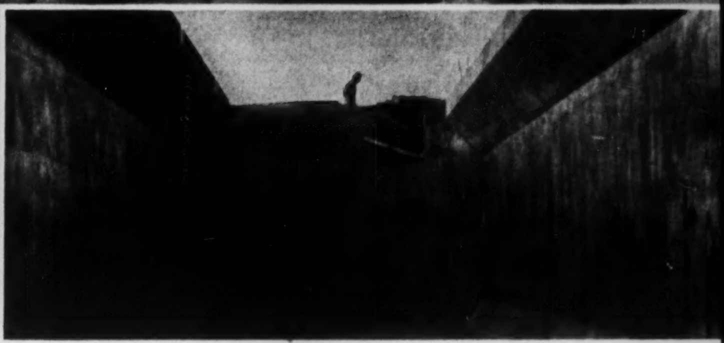
Looking at the AFL-CIO merger, NAM concedes that the merger itself does not create a monopoly but says the danger lies in the "use" of the "tremendous economic strength now centralized in one body." It predicts that through the AFL-CIO, "bargaining strategy can be further developed on a nation-wide, across-the-board basis, with demands, strikes, boycotts and other activities timed and coordinated not only between employers but also between entire industries."

Acknowledging the good faith and "sincere intentions" of the present leaders of the new federation, NAM claims "all history demonstrates that unrestrained power never goes unused or unabused."

(*Continued on page 122*)



Aerial view of Sewage Treatment Plant, Valparaiso, Indiana. Duraplastic cement provides protection against freezing-thawing weather.



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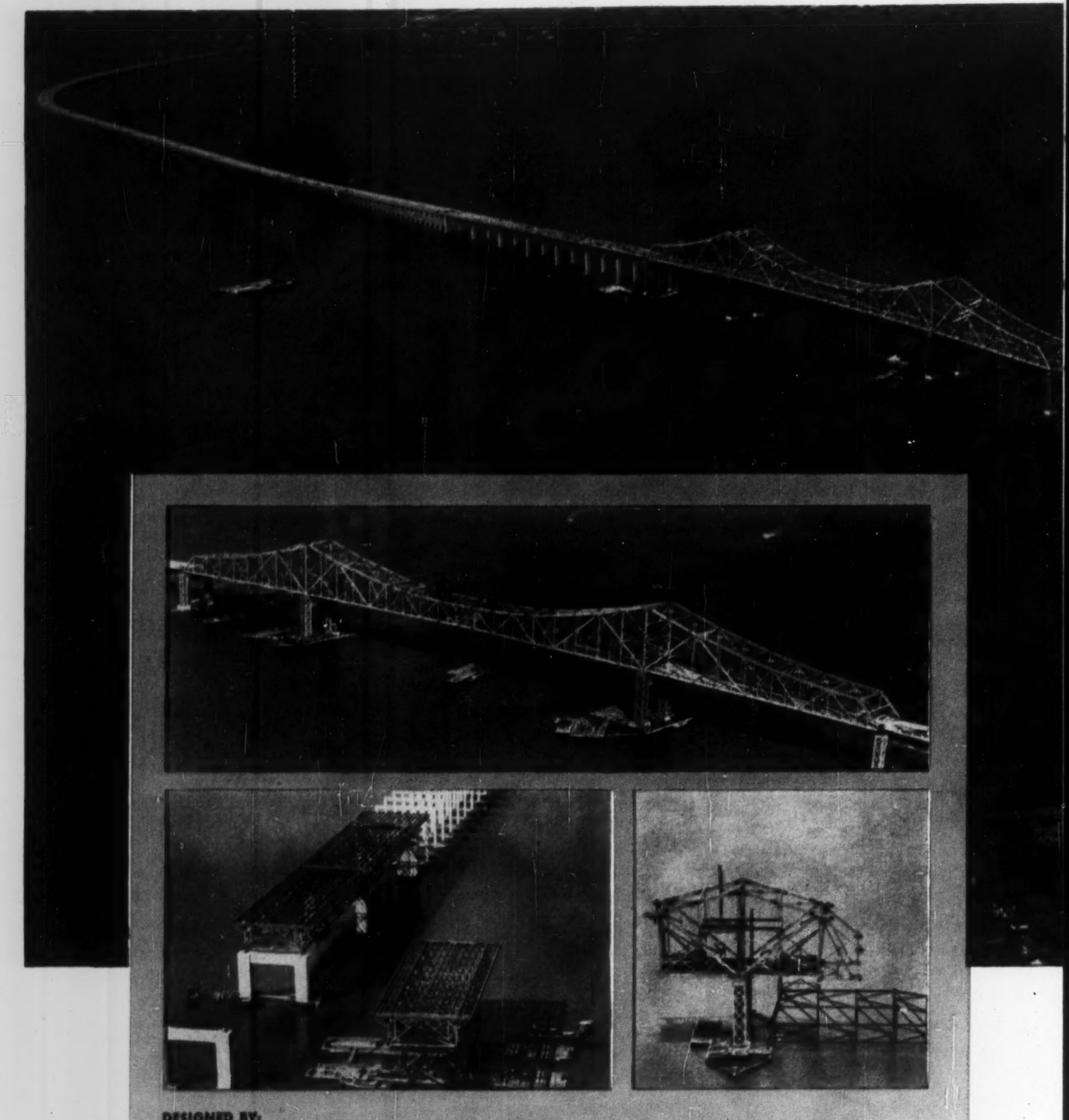

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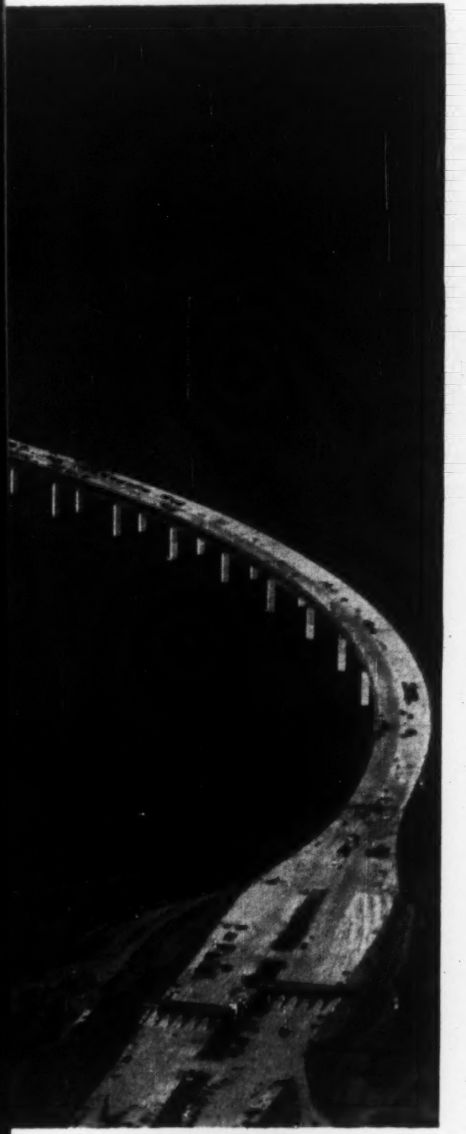

Another BIG one
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Spanning the Tappan Zee of the Hudson River between South Nyack and Tarrytown, this 16,000′ long structure is the longest bridge on the New York Thruway. Containing 58,600 tons of structural steel, it is also one of the biggest projects of its type ever undertaken in the United States. An interesting sidelight on the enormity of the project is the fact that its construction required an additional 6,820 tons of structural steel for special erection material.

The long bridge consists of a 10,127′ west approach made up of seven Deck Truss Spans about 247′ long, one Deck Plate Girder Span 100′ long, and one hundred and sixty-five Deck Beam Spans about 50′ long; the main structure over main navigation channel made up of one Thru Cantilever-and-Suspended Truss Span 1,212′ long and two Thru Truss Anchor Spans 601′-9″ long; and a 3,457′ east approach made up of thirteen Deck Truss Spans measuring 232′ to 247′ in length and seven Deck Beam Spans about 55′ long.

The 30,460-ton main cantilever truss structure is the heaviest of its type in the United States and the third heaviest in the world. Its total length, as well as the length of the main span, is the second longest in this country, and fifth longest in the world. Trusses are 93′ apart, center to center, and the 90-ft. deck carries two 37′ roadways for six lanes of traffic, a 10′ center mall for disabled cars, and two 3′ safety walks. Vertical clearance under the main span is 135′ above mean low tide.

The erection of the huge $60,000,000 structure presented many interesting problems. For example, nineteen of the deck truss spans were assembled at Grassy Point on 16-story-high falsework and floated into position atop the piers 12 miles down the river. Because of the great depth to firm foundation in the river bed, it was impractical to erect the anchor spans of the cantilever structure by means of conventional falsework. Instead, two special falsework truss spans were used, one under each anchor span. These were also constructed at Grassy Point and floated to the site. If you are interested in receiving a more complete story of how this was accomplished, write to our Pittsburgh office.

The Tappan Zee crossing is one of 75 New York Thruway bridges, totaling 90,000 tons of steel and over 6 miles of bridgework, between Rochester and the Hudson River, fabricated by American Bridge. American Bridge also erected 48 of these bridges.

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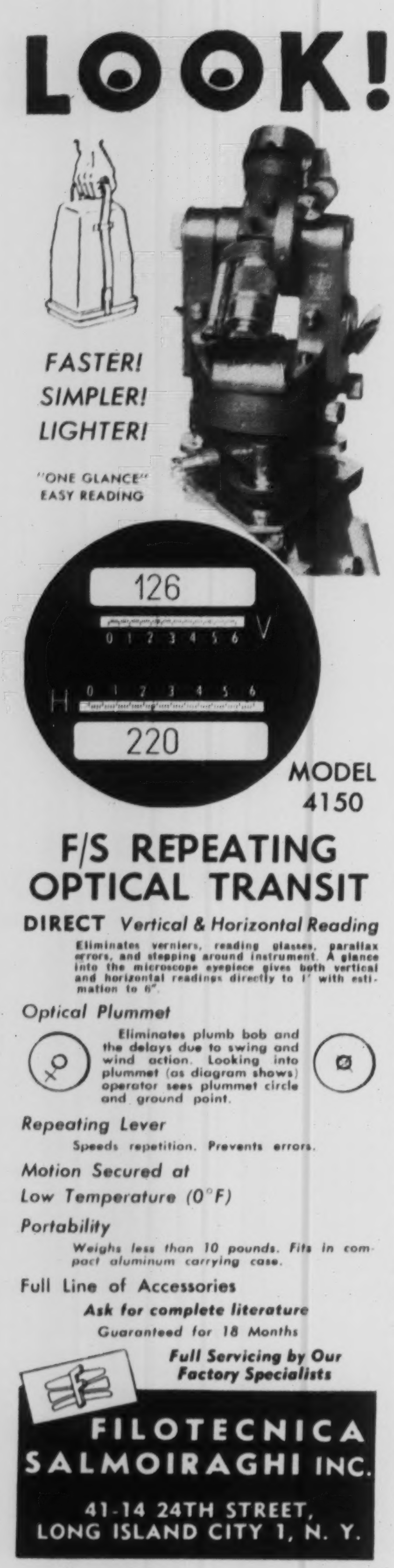
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(Continued from page 118)

• Other viewpoints—Somewhat different views on the effect of the merger were expressed last month by forecasters at the Southern States Industrial Relations Conference in Birmingham, Ala.

Benjamin Miller of the American Trucking Association, for example, said he couldn't see "central power" in the AFL-CIO because of the autonomy of local units, the necessity of reliance on persuasion and influence in the absence of enforcement machinery, and the existence of deep-rooted personal, political and jurisdictional conflicts, which preclude "real central solidarity." Predicting that labor's increased responsibility under the AFL-CIO would tend to stabilize labor relations, he nevertheless cautioned unions that labor is a private institution "fraught" with a public interest. "Let them take note," he said, "that their immunity under anti-trust laws comes only from public consent."

Most conference speakers agreed the merger will be beneficial to the nation as a whole and one said much of today's labor trouble stems from "too much propaganda about the difference between the interests of labor and management," which, he noted, coincide more than they differ.

Concensus of opinion was that the merger's greatest impact would be in stepped-up membership drives and in increased political activity, although some were inclined to discount the effectiveness of the latter because of the natural inability of members to agree among themselves on political candidates. Some looked for emergence of bigger, richer unions, more collective bargaining strength, higher demands, and more difficult strike situations. And one of labor's harsher critics pointed to the Kohler, Westinghouse and Republic Aviation strikes as evidence of the "fantastic strength which labor unions now possess in the U.S."

Meany States Labor's Role As Missouri Forces Merge

AFL-CIO President George Meany has again reminded organized labor that the center of the trade union movement—and its basic concern—is the worker and his family.

Speaking at the merger ceremonies of the state AFL and CIO groups, Meany said, "My particular philosophy is that the trade union movement is to build the standards of life and work for those who work for wages." Merger on the national level, he noted, was grounded on ideals and principles and was not conceived to enrich a few.

He urged organized labor to eliminate from its ranks the small number of members who bring the entire movement into disrepute, playing into the hands of those who wish to destroy it. He suggested that all locals be put to the test of their single purpose of promoting the welfare of the rank-and-file.

States that have completed AFL-CIO mergers are Arkansas, Tennessee, Louisiana and Missouri.

Labor Briefs . . .

• Jobless pay—Utah's Supreme Court has ruled union members aren't entitled to unemployment compensation if their idleness was initiated by union action. Involved were members of two teamster locals thrown out of work when their association employers shut down after other association members had been struck by the union.

• Carpenters hiked—A package basic wage increase of 30 cents has been agreed to between carpenters and contractors in Rochester, N. Y. A two-year contract, effective May 1, grants a 15-cent wage boost now, and another 15 cents in May 1957. Meanwhile the Central Trades and Labor Council has asked unions to push for a 7-hour day.

• No jurisdiction—A Wyoming District Court dismissed requests for an injunction against carpenter and plumber locals peacefully picketing a housing development where nonunion workers are employed. The court reasoned that the builder—and hence the sub—are in interstate commerce, thus giving NLRB exclusive jurisdiction.

• Politics—At the last staff meeting of the AFL-CIO Committee on Political Education, Secretary-Treasurer William Schnitzler said the success of the AFL-CIO political education program would be measured, not by the success of any political party, but by the extent labor's legislative program is enacted on state and federal levels.

• Right-to-work—Further defining the area of legitimate union activities under state right-to-work laws, a Nevada court has ruled that a union may still picket to protest an employer's refusal to negotiate with a bargaining agent designated by his employes. And the Arkansas Supreme Court has upheld IBEW picketing of a nonunion shop, where the object was to publicize substandard wages rather than to compel unionization.

Bids: May 10, 1956

New York State Road Works

NOTICE TO CONTRACTORS: STATE DEPARTMENT OF PUBLIC WORKS, ALBANY, N. Y.—Pursuant to the provisions of the Highway Law, and special provisions for projects financed with Federal Aid Funds, sealed proposals will be received until ten-thirty o'clock A.M., advanced standard time, which is nine-thirty o'clock A.M., eastern standard time, on the 10th day of May, 1956, by Henry A. Cohen, Director, Bureau of Contracts and Accounts, 14th Floor, The Governor Alfred E. Smith State Office Building, Albany, N. Y., for the following projects:

County	Contract No.	Name	Miles	Type	Estimated Deposit	Cost of Work
DISTRICT No. 1, G. L. NICKERSON, District Engineer, 353 Broadway, Albany, N. Y.						
Warren	R.C. 56–9	Lake George Village, S.H. 5068 Lake George–Warrensburg, S.H. 5227	0.14	Asp. Conc., Opt. = 0.07 Mi. Misc. Work ...... = 0.07 Mi. 22′ R.C. Slab Br.	$4,000 Plans $10	$74,000
DISTRICT No. 2, LACY KETCHUM, District Engineer, 109 No. Genesee St., Utica, N. Y.						
Hamilton	FARC 56–81	Hope Center-Wells, Pt. 2, S.H. 5268 Wells–Speculator, Pt. 1, S.H. 5514 Proj. F-1036(4)	3.49	9″ Cem. Conc. Pavt. 22′ Wide = 3.47 Mi. Misc. Work = 0.02 Mi. R.C. Slab Br. 26′	$39,000 Plans $15	711,000
Herkimer	FARC 56–25	Mohawk–Jacksonburg–Little Falls, S.H. 8401 Project F-517(4)	3.38	Asph. Conc., Opt.	$23,000 Plans $15	421,000
Herkimer	FARC 56–10	Cedarville–West Winfield, S.H. 871 Project S-460(1)	1.51	Asph. Conc., Opt.	$12,000 Plans $10	212,000
Madison, Oneida & Chenango	FARC 56–14	Sherburne–Furman Mill, S.H. 705 Furmans Mills–Hubbardsville, S.H. 8297 Hubbardsville–North Brookfield S.H. 8203 North Brookfield–Waterville, S.H. 840 Project F-456(7)	7.88	Asp. Conc., Opt = 7.79 Mi. Misc. Work ...... = 0.09 Mi.	$65,000 Plans $25	1,140,000
Montgomery	FARC 56–11	Fonda, East, S.H. 152 Fonda–Tribes Hill, S.H. 303 Mohawk River Turnpike, Amsterdam–Tribes Hill, S.H. 108 Project F-349(11)	4.41 (1.31) (Acc.)	9″ Cem. Conc. Pavt. 24′–48′ Wide = 4.30 Mi. Asph. Conc., Opt. = 1.16 Mi. T.C. Graded Grav. = 0.26 Mi.	$90,000 Plans $25	1,642,000
DISTRICT No. 3, WILLIAM ROBINSON, District Engineer, Weigh Lock Building, Syracuse, N. Y.						
Cayuga	FARC 56–12 FASH 56–1	Auburn–Weedsport, S.H. 1317 Village of Weedsport: Seneca St. Proj. F-1114(1)	7.24	Asph. Conc., Type 1A	$63,000 Plans $15	1,146,000
Cayuga	FARC 56–19	Groton–Lock–Moravia, S.H. 1016 Project F-610(6)	6.55	Asph. Conc., Type 1A 2 R.C. Closed Box Brs. 46′ & 55.5′ 1 Timber Trestle Ext. 45.2′	$54,000 Plans $15	985,000
Oswego	FARC 56–99	Pulaski–Williamstown, Pt. 1 & Pt. 2, S.H. 1288–972 Project F-533(4)	10.20	Asph. Conc., Type 1A	$50,000 Plans $25	906,000
Oswego	FASS 56–2	Swamp Road (Co. Rd.) Project S-448(1)	3.58	Bit. Mac., Opt. Rd. Mix	$18,000 Plans $10	332,000
Seneca	FARC 56–20	Interlaken–Trumansburg, S.H. 5446 Project F-494(2)	3.98	Asph. Conc., Opt.	$23,000 Plans $10	398,000
Seneca	FASS 56–1	Town Line Road, C.R. 138 Project S-386(1)	1.78	Asph. Conc., Opt.	$9,500 Plans $10	175,000
Seneca	FARC 56–23	Geneva–Waterloo, Pt. 2 & 3, S.H. 8240 Waterloo Village: Main St., S.H. 5709 Waterloo Village: Main St., Pt. 2, S.H. 9252 Waterloo Village, S.H. 1211 Project F-406(3)	1.54	Asph. Conc. Type 2A = 1.44 Mi. Misc. Work ...... = 0.10 Mi.	$37,000 Plans $10	635,000
DISTRICT No. 4, B. F. Perry, Acting District Engineer, Barge Canal Terminal, Rochester, N. Y.						
Genesee	FAC 56–14	Batavia City: Oak Street Arterial (Main St. to North City Line) Project US-93(2)	1.11	Asph. Conc., Type 2A = 0.92 Mi. Widening & Misc. Wk. = 0.19 Mi.	$25,000 Plans $15	467,000
Wyoming	FARC 56–94	Warsaw–Gainesville, S. H. 5400 Project F-380(7); S-177(2)	3.18	Asph. Conc., Opt. = 3.13 Mi. Misc. Work ...... = 0.05 Mi. I-Beam Br. 44′	$40,000 Plans $25	696,000
DISTRICT No. 5, E. G. H. YOUNGMANN, District Engineer, 65 Court St, Buffalo, N. Y.						
Erie	FAC 56–2	City of Tonawanda: Seymour St. Project U-1078(7)	0.34	Asph. Conc., Type 2A = 0.31 Mi. Misc. Work ...... = 0.03 Mi.	$9,000 Plans $10	159,000
Niagara	FAC 56–18	Walnut Street Arterial (Washburn Street to Pound St.); City of Lockport Project U-709(5)	0.42	Asph. Conc., Opt = 0.40 Mi. Misc. Work ...... = 0.02 Mi.	$10,000 Plans $10	183,000
DISTRICT No. 6, J. H. THOMAS, District Engineer, 30 W. Main St., Hornell, N. Y.						
Allegany	FARC 56–26	Caneadea-Fillmore-Hume, S.H. 5518 Fillmore–Portageville, Pt. 1 & Pt. 2, S.H. 9210–8228 Project F-380(5)	3.53	9″ Cem. Conc. Pavt. 22′ & 38′ Wide = 3.51 Mi. Misc. Work ...... = 0.02 Mi. Comp. I-Beam Br. 127′	$45,000 Plans $15	818,000
DISTRICT No. 7, R. W. SWEET, District Engineer, 444 Van Duzee St., Watertown, N. Y.						
Clinton	FARC 56–22	Cadyville–Moffitsville, S.H. 822 West Plattsburg, S.H. 776 Proj. F-645(2)	8.69	Asph. Conc., Opt. 2 Closed Box Brs. 22′ & 24′	$73,000 Plans $50	1,318,000
DISTRICT No. 8, J. S. BIXBY, District Engineer, Pleasant Valley Road, Poughkeepsie, N. Y.						
Columbia	FARC 56–13	Chatham–Chatham Center Pt. 1 & Pt 3 & Pt. 2, S.H. 1563–342; Chatham Center–Riders Mills, S.H. 827 Project S-370(2)	4.19	Asph. Conc., Opt.	$34,000 Plans $15	605,000
Orange	FARC 56–15	Port Jervis–Sullivan County Line, Pt. 1, S.H. 412 Port Jervis–Mongaup, S.H. 8424 Project F-502(15)	2.63 (0.50) (Acc.)	9″ Cem. Conc. Pavt. 24′ Var. Wide = 2.61 Mi. Misc. Work = 0.02 Mi. (Cem. Conc. Pavt. Acc. Rd. = 0.26 Mi.) (Asp. Conc., Opt. Acc. Rd. = 0.24 Mi.)	$38,000 Plans $15	697,000
Rockland	PIP 56–2P	Palisades Interstate Parkway Sect. 2 & Pt. 1 (Route 59 to Route 45)	5.77	8 Cem. Conc. Pavt. 2 @ 24′ Wide	$110,000 Plans $50	1,966,000
Rockland	PIP 56–3P	Palisades Interstate Parkway Sect. 2 (N.J. State Line to Rte. 303)	2.37 (0.43) (Acc.)	8″ Cem. Conc. Pavt. 2 @ 24′ Wide	$50,000 Plans $25	965,000
Ulster	FARC 56–16	Wurtsboro–Ellenville, S.H. 8080 Project F-38(2)	4.19	Asph. Conc., Opt. Ext. Exist. 22′ Slab Br.	$25,000 Plans $10	455,000
DISTRICT No. 9, F. J. WEBER, Acting District Engineer, 71 Frederick St., Binghamton, N. Y.						
Delaware	FARC 56–17 R.C. 56–18	Andes–Margaretville, S.H. 8017 Margaretville–Halcottsville, S.H. 5384 Project S-459(1)	0.48	9″ Cem. Conc. Pavt. 32′–40′ Wide = 0.36 Mi. Asph. Conc., Opt. = 0.09 Mi. Misc. Work = 0.03 Mi.	$16,000 Plans $15	306,000
Chenango	FARC 56–21	Sherburne–Earlville, S.H. 5568 Earlville–Hamilton, S.H. 5585 Project F-691(4)	4.50	9″ Cem. Conc. Pavt. 24′ Wide 2 Comp. I-Beam Brs. 57′ & 65′	$75,000 Plans $25	1,365,000
Otsego	FARC 56–24	East Springfield–Cherry-Valley, S.H. 934 Cherry Valley–Sharon Springs, Sharon Springs–Canajoharie, Pt. 1, S.H. 8064 Project F-65(4)	6.54	Asph. Conc., Type 1A	$30,000 Plans $10	531,000
DISTRICT No. 10, M. E. GOUL, District Engineer, Montauk Highway at Little East Neck Rd., Babylon, L. I., N. Y.						
Bronx	Fiche 56–1	Cross Bronx Expressway Contract 7 (Fulton Ave. to Longfellow Ave.) Project IN-1084 (23)	1.00 (1.84) (Acc.)	9″ Cem. Conc. Pavt. with Carbon Black 2 @ 36′ Wide = 0.82 Mi. Misc. Work = 0.18 Mi. (Acc. Rd. Cem. Conc. Pavt. = 0.28 Mi.) (Acc. Rd. Sheet Asph. = 1.56 Mi.) 4 Hy. Seps, Rig. Frames, 98′, 84.5′, 99′ & 99′ 1 Hy. Sep. R.C. Arch 110.4′ 1 Hy. Sep. Steel Girder 116.4′	$450,000 Plans $100	8,375,000
Bronx	Fiase 56–1	Arthur V. Sheridan Expressway Contract 1 Project IN-1086(2)	0.93	Demolition of Buildings	$9,000 Plans $10	170,000
New York	CBE RC 56–2	Cross Bronx Expressway (Highbridge Interchange Cont. 13C) Fac Be 50–1	0.13	Remove Exist. Reinf. Conc. Pavt.; Asphalt Conc., Opt. and Misc. Work	$1,300 Plans $10	25,000

Maps, plans, specifications and proposal forms may be seen and obtained at the office of the State Department of Public Works, Bureau of Contracts and Accounts, Albany, N. Y., and at the office of the District Engineers noted above, and may also be seen at the office of the State Department of Public Works, 270 Broadway, New York City.

The deposit for Plans and Proposal Forms for each contract is indicated above. A refund will be made in full to bidders for return of one set, in good condition, within 30 days of award, or rejection of bids; refund for all other sets in good condition, similar period, will be 50% of deposit.

Special attention of bidders is called to "General Information for Bidders" in the proposal, specification, and contract agreement, and to the special provisions applying to projects financed with federal funds. Award of a contract is subject to priorities and allocations under the Defense Production Act of 1950, as amended, and all regulations issued thereunder.

Proposal for each contract must be submitted in a separate sealed envelope with the name and number of the contract plainly endorsed on the outside of the envelope. Each proposal must be accompanied by draft or certified check payable to the order of the "STATE OF NEW YORK, COMMISSIONER OF TAXATION AND FINANCE" for the sum as specified in the advertisement and the proposal. The retention and disposal of the bidding check, the execution of the contract and bonds shall conform to the provisions of the Highway Law, as set forth in "Instructions to Bidders."

When optional types are permitted on contracts with federal funds, bidders must state in the space provided in the proposal the exact designation of the optional type upon which the proposal is predicated.

The right is reserved to reject any or all bids.

JOHN W. JOHNSON
SUPT. OF PUBLIC WORKS

OFFICIAL PROPOSALS

Bids: May 10, 1956

Delaware River Port Authority Administration Building Camden, New Jersey

RAMP 'M' STRUCTURE OVER PACKER AVENUE and 20th STREET
PHILADELPHIA APPROACHES
WALT WHITMAN BRIDGE CONTRACT NO. P-12

Sealed bids will be received for Ramp 'M' Structure Over Packer Avenue and 20th Street, Philadelphia Approaches of the Walt Whitman Bridge, known as Contract No. P-12, at the office of the Executive Director of the Delaware River Port Authority, Administration Building, Bridge Plaza, Camden, New Jersey until 2:30 P. M. Eastern Daylight Time, May 10, 1956, at which place and time they will be publicly opened and read by the Authority.

A more complete description of the work and full information for bidders are given in the Contract Documents and Specifications for this Contract, which may be obtained upon the deposit of a $10.00 check which will be remitted upon receipt of bid or the return in good condition of the copies so taken within thirty days after the opening of bids.

Each proposal must be accompanied by a certified check in the sum of $25,000 payable to the Delaware River Port Authority and drawn upon a National or State Bank or Trust Company having an office or place of business either in Philadelphia, Pennsylvania, or Camden, New Jersey, and must not be enclosed with the sealed bid. The surety's consent must be shown. The bidder to whom the contract is awarded will be required to furnish a Performance and Labor and Materialmen's Bond in the sum of 100 percent.

The Authority will afford prospective bidders an opportunity to inspect the site of the work.

The Authority reserves the right to waive any informalities in the bids received; to reject any or all bids, and to award the contract only to those experienced in this class of work and to the bidder whose proposal is deemed by the Authority to be most advantageous to the public interest.

DELAWARE RIVER PORT AUTHORITY
JOSEPH K. COSTELLO
April 18, 1956 Executive Director

Bids: May 10, 1956.

Delaware River Port Authority Administration Building Camden, New Jersey

POLICE BUILDING—GENERAL CONSTRUCTION WORK
GLOUCESTER APPROACH
WALT WHITMAN BRIDGE CONTRACT NO. G-7A

Sealed bids will be received for the Police Building on the Gloucester Approach of the Walt Whitman Bridge, known as Contract No. G-7A, at the office of the Executive Director of the Delaware River Authority, Administration Building, Bridge Plaza, Camden, New Jersey, until 2:30 P. M. Eastern Daylight Time, May 10, 1956, at which place and time they will be publicly opened and read by the Authority.

A more complete description of the work and full information for bidders are given in the Contract Documents and Specifications for this Contract, which may be obtained upon the deposit of a $10.00 check, which will be remitted upon receipt of bid or the return in good condition of the copies so taken within thirty days after the opening of bids.

Each proposal must be accompanied by a certified check in the sum of $2,000, payable to the Delaware Diver Port Authority and drawn upon a National or State Bank or Trust Company having an office or place of business either in Philadelphia, Pennsylvania, or Camden, New Jersey, and must not be enclosed with the sealed bid. The surety's consent must be shown. The bidder to whom the contract is awarded will be required to furnish a Performance and Labor and Materialmen's Bond in the sum of 100 percent.

The Authority will afford prospective bidders an opportunity to inspect the site of the work.

The Authority reserves the right to waive any informalities in the bids received; to reject any or all bids, and to award the contract only to those experienced in this class of work and to the bidder whose proposal is deemed by the Authority to be most advantageous to the public interest.

DELAWARE RIVER PORT AUTHORITY
JOSEPH K. COSTELLO
Executive Director

OFFICIAL PROPOSALS

Bids: May 10, 1956

Delaware River Port Authority Administration Building Camden, New Jersey

POLICE BUILDING—PLUMBING WORK
GLOUCESTER APPROACHES
WALT WHITMAN BRIDGE CONTRACT NO. G-7B

Sealed bids will be received for the Police Building Plumbing Work on the Gloucester Approaches of the Walt Whitman Bridge, known as Contract No. G-7B, at the office **of the Executive** Director of the Delaware River Port Authority, Administration Building, Bridge Plaza, Camden, New Jersey until 2:30 P. M. Eastern Daylight Time, May 10, 1956, at which place and time they will be publicly opened and read by the Authority.

A more complete description of the work and full information for bidders are given in the Contract Documents and Specifications for this Contract, which may be obtained upon the deposit of a $10.00 check, which will be remitted upon receipt of bid or the return in good condition of the copies so taken within thirty days after the opening of bids.

Each proposal must be accompanied by a certified check in the sum of $200.00 payable to the Delaware River Port Authority and drawn upon a National or State Bank or Trust Company having an office or place of business either in Philadelphia, Pennsylvania, or Camden, New Jersey, and must not be enclosed with the sealed bid. The surety's consent must be shown. The bidder to whom the contract is awarded will be required to furnish a Performance and Labor and Materialmen's Bond in the sum of 100 percent.

The Authority will afford prospective bidders an opportunity to inspect the site of the work.

The Authority reserves the right to waive any informalities in the bids received; to reject any or all bids, and to award the contract only to those experienced in this class of work and to the bidder whose proposal is deemed by the Authority to be most advantageous to the public interest.

DELAWARE RIVER PORT AUTHORITY
JOSEPH K. COSTELLO,
Executive Director

Bids: May 10, 1956.

Delaware River Port Authority Administration Building Camden, New Jersey

POLICE BUILDING—HEATING WORK
GLOUCESTER APPROACHES
WALT WHITMAN BRIDGE CONTRACT NO. G-7C.

Sealed bids will be received for the Police Building Heating work, on the Gloucester Approaches of the Walt Whitman Bridge, known as Contract No. G-7C at the office of the Executive Director of the Delaware River Port Authority, Administration Building, Bridge Plaza, Camden, New Jersey until 2:30 P. M. Eastern Daylight Time, May 10, 1956, at which place and time they will be publicly opened and read by the Authority.

A more complete description of the work and full information for bidders are given in the Contract Documents and Specifications for this Contract, which may be obtained upon the deposit of a $10.00 check which will be remitted upon receipt of bid or the return in good condition of the copies so taken within thirty days after the opening of bids.

Each proposal must be accompanied by a certified check in the sum of $200.00 payable to the Delaware River Port Authority and drawn upon a National or State Bank or Trust Company having an office or place of business either in Philadelphia, Pennsylvania, or Camden, New Jersey, and must not be enclosed with the sealed bid. The surety's consent must be shown. The bidder to whom the contract is awarded will be required to furnish a Performance and Labor and Materialmen's Bond in the sum of 100 percent.

The Authority will afford prospective bidders an opportunity to inspect the site of the work.

The Authority reserves the right to waive any informalities in the bids received; to reject any or all bids, and to award the contract only to those experienced in this class of work and to the bidder whose proposal is deemed by the Authority to be most advantageous to the public interest.

DELAWARE RIVER PORT AUTHORITY
JOSEPH K. COSTELLO,
Executive Director

OFFICIAL PROPOSALS

Bids: May 3, 1956

New York State Road Work

NOTICE TO CONTRACTORS

STATE DEPARTMENT OF PUBLIC WORKS, ALBANY, N. Y.—Pursuant to the provisions of Highway Law, sealed proposals will be received until 10:30 A.M., Eastern Daylight Saving Time, on May 3, 1956, by Henry A. Cohen, Director, Bureau of Contracts and Accounts, 14th Floor, The Governor Alfred E. Smith State Office Building, Albany, N. Y. for

SOIL EXPLORATIONS AND FOUNDATION INVESTIGATIONS AT VARIOUS SITES ON INTERSTATE ROUTE 5, SECTIONS A, B AND C, FROM OSWEGO COUNTY LINE TO PHILOMEL CREEK, TOWNSHIPS OF ELLISBURG, ADAMS, HOUNSFIELD, WATERTOWN AND PAMELIA, JEFFERSON COUNTY, WHICH CONSTITUTES CONTRACT NO. SPEC. SM-84

Maps, plans and specifications may be examined and obtained at the following offices:

(a) Bureau of Contracts and Accounts, 14th Floor, The Governor Alfred E. Smith State Office Building, Albany 1, New York.
(b) Mr. Robert W. Sweet, District Engineer, 444 VanDuzee Street, Watertown, New York.
(c) Mr. William M. Trainer, Associate Contract Engineer, Department of Public Works, 270 Broadway, New York City.

The deposit for a set of plans, specifications and proposal forms is $5.00. A refund in full will be made to bidders for return of one set in good condition within 30 days of award or rejection of bids; refund for all other sets in good condition, similar period, will be 50% of deposit.

The Engineer's estimate of cost for this work is $15,800.00.

Proposal for this contract must be submitted in separate sealed envelope with the name of the contract plainly endorsed on the outside of the envelope. Proposal must be accompanied by draft or certified check, payable to the order of the "State of New York, Commissioner of Taxation and Finance" for the sum of $790.00. The retention and disposal of the bidding check, the execution of the contract and bonds shall conform to the provisions of the Highway Law, as set forth in "Instruction to Bidders."

The right is reserved to reject any or all bids.

J. W. JOHNSON
SUPT. OF PUBLIC WORKS

U. S. Government

United States Department of Commerce, Bureau of Public Roads, April 26, 1956. Sealed bids will be received at the Inter-American Highway Office, Bureau of Public Roads, Room 4009, General Services Building, Washington 25, D. C., until 2 p.m., e.d.t., June 1, 1956 for the construction of approximately 56 miles of highway, including one major bridge, on the Inter-American Highway in southern Costa Rica, identified as Costa Rica Project 75-56-4. The project begins at the Platanares River about 140 miles southeast from San Jose and ends at a Ballast Pit approximately 25 miles southeast of Palmar. The project is isolated and prospective bidders are requested to arrive in San Jose, Costa Rica, prior to May 10, 1956 in order to join a scheduled group inspection of the work. Details of group inspection trip will be furnished as a part of the plans. The approximate quantities of the major item are as follows: 4,300,000 cu. meters Unclassified Excavation, 230,000 tons Crushed Gravel or Stone Base, 10,300 cu. yds Concrete Class "A" (culverts), 1,115,000 lbs. Reinforcing Steel (culverts), 17,500 cu. meters Cement Rubble Masonry, 22,000 lin. ft. Bituminous Coated Nestable Sheet Metal Pipe Culvert (24" to 48"), 1,000 cu. yards Concrete Class "A" (bridges) 2,000 cu. yds. Concrete Class "B" (bridges), 350,000 lbs. Reinforcing Steel (bridges) 1,700,000 lbs. Structural Steel (bridges). Bids will be accepted only from United States or Costa Rica firms with a satisfactory record of performance in the United States or Costa Rica. Plans, Specifications and Proposal Forms are available upon request at the address given above or from the District Engineer, Bureau of Public Roads, Fifth Floor, Hotel Costa Rica, San Jose, Costa Rica, C.D. Curtiss, Commissioner.

Bids: May 10, 1956

New York State Road Work

NOTICE TO CONTRACTORS: STATE DEPARTMENT OF PUBLIC WORKS, ALBANY, N. Y.—Pursuant to the provisions of the Highway Law, and special provisions for projects financed with Federal Aid Funds, sealed proposals will be received until ten-thirty o'clock A.M., advanced standard time, which is nine-thirty o'clock A.M., eastern standard time, on the 10th day of May 1956 by Henry A. Cohen, Director, Bureau of Contracts and Accounts, 14th Floor, The Governor Alfred E. Smith State Office Building, Albany, N. Y., for the following projects:

County	Contract No.	Name	Miles	Type	Deposit	Estimated Cost of Work
DISTRICT No. 3, William Robinson, District Engineer Weigh Lock Building, Syracuse, N. Y.						
Onondaga	FARC 56-97 FGRC 56-98	Baldwinsville-Cold Spring, S.H. 671 Cold Spring-Liverpool, S.H. 670 Project No. S-405(2); SG-405(3)	1.06	Asph. Conc., Opt. 1 Br. Deck Plate Girder 500′ 1 RR Sep. Comp. I-Beam 164.5′	$85,000 Plans $25	$1,570,000
DISTRICT No. 10, M. E. Goul, District Engineer, Montauk Highway at Little East Neck Road, Babylon, L. I., N. Y.						
Kings	FA BQE 56-3	Brooklyn-Queens Expressway (Contract 16-A) Project U-1066(9)	0.52	Demolition	$3,200 Plans $10	58,000

Maps, plans, specifications and proposal forms may be seen and obtained at the office of the State Department of Public Works, Bureau of Contracts and Accounts, Albany, N. Y., and at the office of the District Engineers noted above, and may also be seen at the office of the State Department of Public Works, 270 Broadway, New York City.

The deposit for Plans and Proposal Forms for each contract is indicated above. A refund will be made in full to bidders for return of one set, in good condition, within 30 days of award, or rejection of bids; refund for all other sets in good condition, similar period, will be 50% of deposit.

Special attention of bidders is called to "General Information for Bidders" in the proposal, specification, and contract agreement, and to the special provisions applying to projects financed with federal funds. Award of a contract is subject to priorities and allocations under the Defense Production Act of 1950, as amended, and all regulations issued thereunder.

Proposal for each contract must be submitted in a separate sealed envelope with the name and number of the contract plainly endorsed on the outside of the envelope. Each proposal must be accompanied by draft or certified check payable to the order of the "STATE OF NEW YORK, COMMISSIONER OF TAXATION AND FINance" for the sum as specified in the advertisement and the proposal. The retention and disposal of the bidding check, the execution of the contract and bonds shall conform to the provisions of the Highway Law, as set forth in "Instructions to Bidders."

When optional types are permitted on contracts with federal funds, bidders must state in the space provided in the proposal the exact designation of the optional type upon which the proposal is predicated.

The right is reserved to reject any or all bids.

JOHN W. JOHNSON
Supt. of Public Works

Bids: May 7, 1956.

Town of Maine, Broome County, New York

NOTICE TO BIDDERS

Bids, May 7, 1956, Steel Work, Broome County Airport, Mount Ettrick, Town of Maine, Broome County, New York.

Pursuant to Section 103, as amended, of the General Municipal Law, sealed proposals will be received by the Clerk of the Board of Supervisors at the Broome County Office Building, Binghamton, New York, until 12 o'clock A.M., E.D.S.T. on Monday, May 7, 1956, at which time sealed proposals will be publicly opened and read, for the designing, furnishing and delivering of the following:

A Cantilever Type Steel Hangar Structure at the Broome County Airport, Broome County, New York.

This structure shall be 120′ deep, 200′ long and 30′ high in the main hangar area and 40′ deep by 200′ long in the shop and office lean-to area as shown on the size and clearance drawing accompanying the specifications. Motor driven, insulated hangar doors shall be provided across the 30′ high, 200′ long front and one 30′ high, 120′ long end. The end doors when opened shall stack beside the end of the lean-to as shown on the drawing. The Front Door shall be arranged on three or four continuous rails across the entire front of the hangar so that they may be stacked together to leave a front opening of at least 160′ at one time. Each of the two 18′ wide tail houses at the front of the hangar above the main 30′ high door shall be equipped with a 14′ wide, 10′ high overhead type door with individual motor drive. At each of these points, an 14′ long section of the top guide channels for the main front hangar doors, together with the supporting brackets and canopies for these top guide channels shall be fastened to the lowest leaf of the wide overhead type tail gate door so that this section of the entire top guide channel assembly shall raise out of the way when the tail gate door is open.

The steel structure for the entire hangar shall be of the steel suppliers own cantilever style design, the details of the design to be subject to the approval of the Broome County Engineer. Each bidder shall submit with his bid a structural drawing showing the type of cantilever structure he proposes to furnish with design calculations, and the size of the main members, and the stress analysis to show the manner in which his proposed design meets the specified requirements. All structural support for the cantilever over the hangar section shall be as shown on the drawing.

Specifications, drawings and proposal forms may be seen at the office of the County Engineer, County Office Building, Binghamton, New York. Copies may be obtained upon deposit of $10.00 for each set with check payable to the Broome County Treasurer. Special attention is called to the Information For Bidders in the proposal specifications and contract agreements. Contract proposals must be submitted in a sealed envelope with the words "STEEL WORK, HANGAR #2" plainly endorsed on the outside of the envelope. Each proposal must be accompanied by cash, draft or certified check payable to the Treasurer of Broome County in an amount equal to 5% of the amount of the bid as a guarantee that the bidder will enter into the contract if it is awarded to him.

The retention and disposal of such cash, draft or check by the County of Broome shall conform with Section 105 of the General Municipal Law, as amended.

The right is reserved to reject any or all bids.

Dated: April 6, 1956
Signed AIRPORT COMMITTEE
Broome County Board of Supervisors
Leland L. Jones
Edwin M. Jones
Erford G. Barrows
Harold B. Christian
John E. Ash

Bids: June 28, 1956.

Roadway & Bridges

COMITÉ EJECUTIVO DE VIALIDAD
PROVINCIA DEL GUAYAS
GUAYAQUIL, ECUADOR

Notice is hereby given that the Comité Ejecutivo de Vialidad will receive bids for construction of a highway between Nobol in the Province of Guayas to Jipijapa in the Province of Manabi, all in the Republic of Ecuador, a distance of 106 kilometers, more or less.

Discription of work—Principal items of work include 390 hectares clearing and grubbing; 2,408,000 cubic meters unclassified roadway excavation; 32,670 cubic meters unclassified structure excavation; 737,600 cubic meters—100 meter overhaul, unclassified roadway excavation and borrow; 842,000 cubic meter kilometers haul and apply water; 243,000 cubic meters selected borrow base course; 2,413,000 cubic meter kilometers, over haul selected borrowed base course, 7,670 linenal meters corrugated metal pipe various diameters, 24" to 96"; forty each reinforced concrete box culverts, 3 reinforced concrete flat slab bridges, and 1-6 span, I-beam girder bridge with concrete deck, principal items of which are 7,100 cubic meters P.C. Concrete, 700,000 lbs. reinforcing steel, 300,000 lbs. structural steel and 160 piles.

Plans may be examined and forms of proposal, bonds, contracts and specifications may be obtained, at the office of the Comité in Guayaquil, Ecuador.

A representative of the Comité will be available to accompany prospective bidders for an inspection of the work herein contemplated and contractors are urged to investigate the location, character and quantity of work to be done.

Each bid shall be made out on a form which shall be obtained at the office of the Comité. Each bid shall be accompanied by a certified check for Five Hundred Thousand (S/500,000.00) sucres or Thirty Three Thousand ($33,000.00) Dollars, as a proposal guarantee, and no bid shall be considered unless such certified check is enclosed therewith. The certified check shall be made payable to the order of the Comité Ejecutivo de Vialidad.

Bids shall be sealed and filed with the Comité Ejecutivo de Vialidad, at their office in Guayaquil, Ecuador on or before six o'clock, P. M. on the 28th of June 1956 and will be opened and publicly read aloud at or about six o'clock, P. M. of that day in the conference room of said office.

COMITÉ EJECUTIVO de VIALIDAD,
CASILLA 4182, GUAYAQUIL, ECUADOR,
S.A.

CABLE: COMIVIAL
CONSULTING ENGINEERS:
MICHAEL BAKER, JR., INC.
CASILLA 4746 GUAYAQUIL,
ECUADOR, S.A.

Bids: May 10, 1956.

Delaware River Port Authority Administration Building Camden, New Jersey

POLICE BUILDING—ELECTRICAL WORK—GLOUCESTER APPROACHES WALT WHITMAN BRIDGE CONTRACT NO. G-7D

Sealed bids will be received for the Police Building Electrical work, on the Gloucester Approaches of the Walt Whitman Bridge, known as Contract No. G-7D, at the office of the Executive Director of the Delaware River Port Authority, Administration Building, Bridge Plaza, Camden, New Jersey until 2:30 P. M. Eastern Daylight Time, May 10, 1956, at which place and time they will be publicly opened and read by the Authority.

A more complete description of the work and full information for bidders are given in the Contract Documents and Specifications for this Contract, which may be obtained upon the deposit of a $10.00 check which will be remitted upon receipt of bid or the return in good condition of the copies so taken within thirty days after the opening of bids.

Each proposal must be accompanied by a certified check in the sum of $200.00 payable to the Delaware River Port Authority and drawn upon a National or State Bank or Trust Company having an office or place of business either in Philadelphia, Pennsylvania, or Camden, New Jersey, and must not be enclosed with the sealed bid. The surety's consent must be shown. The bidder to whom the contract is awarded will be required to furnish a Performance and Labor and Materialmen's Bond in the sum of 100 percent.

The Authority will afford prospective bidders an opportunity to inspect the site of the work.

The Authority reserves the right to waive any informalities in the bids received; to reject any or all bids, and to award the contract only to those experienced in this class of work and to the bidder whose proposal is deemed by the Authority to be most advantageous to the public interest.

DELAWARE RIVER PORT AUTHORITY
JOSEPH K. COSTELLO,
Executive Director

Bids: May 15, 1956

Mackinac Bridge Authority

Advertisement for Proposals
for the
Construction of the Deck Concrete
and Asphalt
for
Mackinac Straits Bridge

The Mackinac Bridge Authority will receive sealed proposals for the construction of Contract No. 3, Deck Concrete and Asphalt, for the Mackinac Straits Bridge until 10:00 A.M. Eastern Standard Time on the 15th day of May, 1956, at the office of the Authority, 608 Prudden Building, Lansing, Michigan, at which time and place proposals will be publicly opened and read aloud.

The work of this contract includes the construction of the concrete deck and asphalt surfacing for two 23-ft. wide roadways, together with walkways, on the suspension spans and truss span approaches of this bridge.

The bridge consists of four, four-span continuous truss span units on the south approach as follows: (160-200-200-160), (327.5-393-393-327.5), (480-560-560-480), and (327.5-393-393-327.5) feet in length; three, four-span continuous truss spans on the north approach as follows: (160-200-200-160), (327.5-393-393-327.5) and (327.5-393-393-327.5) feet in length; two anchorages 135 feet in length; two backstay spans 472 feet in length, two suspended side spans eighteen hundred (1800) feet in length, and the main suspended span thirty-eight hundred (3800) feet in length. All the abovementioned spans with the exception of the first 160-foot span on the south approach are over water, the main span being 155 feet above low water at center of span.

The principal items of work include:

	Approximate Quantities
Bituminous Concrete	6,025 Tons
Grade A Concrete	11,536 Cu. Yds.
Lightweight Concrete	2,029 Cu. Yds.
Steel Reinforcement	2,637,911 Lbs.

Plans, Specifications, Proposal Form and Contract Documents for the work are on file in the office of the Mackinac Bridge Authority and in the office of D. B. Steinman, Consulting Engineer, 117 Liberty Street, New York 6, New York, and may be inspected by prospective bidders during office hours.

Plans, Specifications, Proposal Form and Contract Documents may be obtained from D. B. Steinman, Consulting Engineer, 117 Liberty Street, New York 6, New York upon application and payment of a fee of twenty-five ($25.00) dollars, fifteen ($15.00) dollars of which will be refunded upon return of the Plans to non-bidders, and all of which would be returned to bidders.

Bids must be made upon the proposal form included in the Contract Documents. Each proposal must be accompanied by draft or certified check payable to the order of the Mackinac Bridge Authority for the sum of one hundred thousand ($100,000.00) dollars.

The right is reserved to reject any or all bids.

MACKINAC BRIDGE AUTHORITY
Prentiss M. Brown, Chairman

Bids: June 5, 1956

Power Authority of the State of New York Advertisement for Proposals

FOR
ELECTRICAL WORK AT THE
BARNHART ISLAND SWITCHYARD
NEAR MASSENA, ST. LAWRENCE
COUNTY, NEW YORK
SPECIFICATION NO. PA-5-14032
ST. LAWRENCE CONTRACT NO. 26

NOTICE TO CONTRACTORS: The POWER AUTHORITY OF THE STATE OF NEW YORK will receive sealed proposals for the electrical work at the Barnhart Island Switchyard near Massena, St. Lawrence County, New York, in the following ways:

(1) If brought in person on the day of receiving bids, until 10:30 A. M. Eastern Daylight Saving Time on the 5th day of June, 1956, 270 Broadway, Hearing Room C on the 6th floor, New York, New York.

(2) If mailed in, until 10:15 A. M. Eastern Daylight Saving Time on the 5th day of June, 1956, at the Authority's office, 270 Broadway, Room 1300, New York 7, New York.

The proposals will be publicly opened and read aloud at the time and at the address given in (1) above.

The work includes but is not limited to the installation of the following Authority furnished equipment consisting of high pressure oil pipe type cable, power circuit breakers, disconnecting switches, lightning arresters, carrier current equipment, metering equipment, insulator assemblies and bus supports for both 115 kv and 230 kv service, autotransformers, metalclad switchgear, unit substations, motor control center, control battery and appurtenances, lighting and miscellaneous power transformers, lighting system and all wire and cable; the furnishing and installing of miscellaneous electrical equipment, exposed conduit and grounding, switchyard buses, line and static conductors, cable trays and clocks; and making electrical connections to equipment of a basically non-electrical nature such as the air compressor insulating oil system; cooling water system; fire protection system and sump pumps.

The work shall be completed on or before December 1, 1959.

Plans, specifications and Proposal Forms for the work will be on file in the Authority's office and in the offices of the Engineer, Uhl, Hall & Rich, 230 Congress Street, Boston 10, Massachusetts, and the Hydro-Electrical Power Commission of Ontario, 620 University Avenue, Toronto 2, Ontario, may be inspected by prospective bidders during office hours, and may be obtained from the Power Authority of the State of New York, 270 Broadway, Room 1300, New York 7, New York, upon application and prepayment of a fee of Twenty-Five ($25.00) dollars, for initial set and Ten ($10.00) dollars for each additional set, no part of which will be refunded.

Bids must be made in duplicate in accordance with instructions contained in the Information for Bidders. Guarantee will be required with each bid in an amount not less than 10 percent of the gross sum bid.

The right is reserved to reject any or all bids.

GENERAL MANAGER
W. S. CHAPIN

Bids: May 3, 1956

New York State Road Work

STATE DEPARTMENT OF PUBLIC WORKS, ALBANY, N. Y.—Pursuant to the provisions of Highway Law, sealed proposals will be received until 10:30 A.M., Eastern Daylight Saving Time, on May 3, 1956, by Henry A. Cohen, Director, Bureau of Contracts and Accounts, 14th Floor, The Governor Alfred E. Smith State Office Building, Albany, N. Y. for

SOIL EXPLORATIONS AND FOUNDATION INVESTIGATIONS AT VARIOUS SITES ON MAJOR DEEGAN EXPRESSWAY, FROM PARK AVENUE TO CYPRESS AVENUE, CITY OF NEW YORK, BRONX COUNTY, WHICH CONSTITUTES CONTRACTS NO. SPEC. SM-86

Maps, plans and specifications may be examined and obtained at the following offices:

(a) Bureau of Contracts and Accounts, 14th Floor, The Governor Alfred E. Smith State Office Building, Albany 1, New York.

(b) Mr. M. E. Goul, District Engineer, 325 West Main Street, Babylon, L. I., New York.

(c) Mr. William M. Trainer, Associate contract Engineer, Department of Public Works, 270 Broadway, New York City.

The deposit for a set of plans, specifications and proposal forms is $5.00. A refund in full will be made to bidders for return of one set in good condition within 30 days of award or rejection of bids; refund for all other sets in good condition, similar period, will be 50% of deposit.

The Engineer's estimate of cost for this work is $11,900.00.

Proposal for this contract must be submitted in separate sealed envelope with the name of the contract plainly endorsed on the outside of the envelope. Proposal must be accompanied by draft or certified check, payable to the order of the "State of New York, Commissioner of Taxation and Finance" for the sum of $600.00. The retention and disposal of the bidding check, the execution of the contract and bonds shall conform to the provisions of the Highway Law, as set forth in "Instructions to Bidders."

The right is reserved to reject any or all bids.

J. W. JOHNSON
SUPT. OF PUBLIC WORKS

Bids: May 3, 1956

New York State Road Work

NOTICE TO CONTRACTORS

STATE DEPARTMENT OF PUBLIC WORKS, ALBANY, N. Y.—Pursuant to the provisions of Highway Law, sealed proposals will be received until 10:30 A.M., Eastern Daylight Saving Times, on May 3, 1956, by Henry A. Cohen, Director, Bureau of Contracts and Accounts, 14th Floor, The Governor Alfred E. Smith State Office Building, Albany, N. Y. for

SOIL EXPLORATIONS AND FOUNDATION INVESTIGATIONS AT VARIOUS SITES ON SPRAIN PARKWAY, FROM BRONX RIVER PARKWAY, YONKERS, TO JACKSON AVENUE, TOWN OF GREENBURGH, WESTCHESTER COUNTY, WHICH CONSTITUTES CONTRACT NO. SPEC. SM-85

Maps, plans and specifications may be examined and obtained at the following offices:

(a) Bureau of Contracts and Accounts, 14th Floor, The Governor Alfred E. Smith State Office Building, Albany 1, New York.

(b) Mr. J. S. Bixby, District Engineer, Pleasant Valley Road, Poughkeepsie, New York.

(c) Mr. William M. Trainer, Associate Contract Engineer, Department of Public Works, 270 Broadway, New York City.

The deposit for a set of plans, specifications and proposal forms is $5.00. A refund in full will be made to bidders for return of one set in good condition within 30 days of award or rejection of bids; refund for all other sets in good condition, similar period, will be 50% of deposit.

The Engineer's estimate of cost for this work is $15,200.00.

Proposal for this contract must be submitted in separate sealed envelope with the name of the contract plainly endorsed on the outside of the envelope. Proposal must be accompanied by draft or certified check, payable to the order of the "State of New York, Commissioner of Taxation and Finance" for the sum of $760.00. The retention and disposal of the bidding check, the execution of the contract and bonds shall conform to the provision of the Highway Law, as set forth in "Instruction to Bidders."

The right is reserved to reject any or all bids.

J. W. JOHNSON
SUPT. OF PUBLIC WORKS

Bids: May 15, 1956

Contract EXD-170.001

ADVERTISEMENT
THE PORT OF NEW YORK AUTHORITY
PORT AUTHORITY BUILDING
CAFETERIA AND DINING ROOM
ALTERATIONS

Sealed proposals for alterations to the Cafeteria and Dining Rooms of the Port Authority Building, at 111 Eighth Avenue, New York 11, N. Y., will be received at the office of the Chief Engineer of The Port of New York Authority, Room 1100, 111 Eighth Avenue, New York 11, N. Y., until 2:30 P. M. on Tuesday, May 15, 1956, at which time said proposals will be opened and read in Room 1108.

Contract documents may be seen at the office of the Engineer of Design of the Authority, Room 1112. Documents will be furnished upon deposit of $30.00 per set for not more than three sets to any one company (each set including one copy of the contract drawings). Additional sets will be furnished upon payment of $30.00 per set, which payment is not returnable. Deposits and payments shall be delivered to the Treasury Department, Room 1031, where a receipt in duplicate will be issued. A copy of the receipt shall be delivered to Room 1112, where the documents will be furnished.

Those who have submitted a bid on the contract will receive a refund of the deposit for each set of documents, not exceeding three, returned within forty days after the opening of proposals. Those who have not submitted a bid will receive a refund of one-half of the deposit for each set of documents, not exceeding three, returned within forty days after the opening of proposals.

THE PORT OF NEW YORK AUTHORITY
Donald V. Lowe, Chairman

New York, April 26, 1956

EMPLOYMENT OPPORTUNITIES

The Advertisements in this section include all employment opportunities—executive, management, technical, selling, office, skilled, manuel, etc.

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Graduate Mechanical Engineer with a minimum of 7 years' experience in the selection, design, operation and maintenance of heavy industrial mechanical equipment. This includes Diesel engines, compressors, pumps, turbines, and other related machinery for oil refinery, power plants and oil producing facilities. Good industrial contacts required. For New York Engineering Department, but job requires occasional travel to Europe and the Middle East.

Salary commensurate with experience and training. Liberal benefit program. Write outlining personal history and work experience.

Recruiting Supervisor, Box 112

ARABIAN AMERICAN OIL COMPANY
505 PARK AVENUE
NEW YORK 22, N. Y.

WANTED

CIVIL ENGINEER

PUBLIC WORKS DEPARTMENT,
ENGINEERING DIVISION,
TOWN OF NATICK

Applicants must be graduate C.E. or have 2 years Engineering College or equivalent and experience in Field Engineering, construction, inspection, and surveying in connection with Highways, Water and Sewer Systems. Administration experience in Engineering Office desirable. Salary Range $4830 to $5310. Vacations. Insurance (life plan.) Retirement System. Applications will be received in the Office of the Director of Public Works, Mr. Walter F. Burdick, 44 Middlesex Avenue, Natick, Massachusetts.

BITUMINOUS PAVING RESEARCH SCIENTIST

Outstanding bituminous paving scientist to head up research program on well-known new paving material. Finest laboratory facilities (Atlantic seaboard). This opportunity is a challenging one with an international organization. Salary first year—approximately $15,000. Personal interviews will be arranged at our expense with selected applicants.

P-1439, Engineering News-Record
320 W. 42 St., New York 36, N. Y.

REPLIES (Box No.): Address to office nearest you
NEW YORK: 330 W. 42nd St. (36)
CHICAGO: 520 N. Michigan Ave. (11)
SAN FRANCISCO: 68 Post St. (4)

POSITIONS VACANT

Engineers Grade III (Registered) to $7,951; Grade II to $6,502; grade level and salary dependent upon experience in the design of streets, sewers, sanitary constructions, and illumination field. 40 hr. wk. Paid vacation, sick leave, group life insurance. $2,600 pension after 25 yrs. Write to Department of Personnel, City Hall, Dearborn, Mich.

Wanted: Surveyor or Engineer capable of doing layout work for air base paving and grading work. Also must be familiar with doing own computations and cross sectioning of volumes. Located in Texas and Oklahoma. P-1404, Engineering News-Record.

A new general engineering construction company now being organized in California requires a construction executive with ability to develop a sound producing company. Applicant must have engineering degree, necessary field and office experience and have thorough knowledge of business. Salary open to right person. P-1268, Engineering News-Record.

Engineers experienced in design and supervision of construction to work as resident engineers or prepare plans for water and sewer systems. Also architects for preparation of plans for general building work. State experience, age, salary required, when can report, and give references. Reply P-1398, Engineering News-Record.

Municipal consultant and land surveyor in Detroit area wants chiefs of party. Land surveyor, minimum 3 years experience, registered preferred. Construction layout party chief. Salaries commensurate with ability—$6,300-$7,500. P-1364, Engineering News-Record.

University Teaching position open in the fields of engineering drawing and descriptive geometry, Dept. of Engineering Mechanics, University of Nebraska. Engineering degree is necessary. Opportunity to do graduate work. Rank and salary based on applicant's education and experience. Write inquiries to E. J. Marmo, Professor and Chairman of Department, Lincoln 8, Nebraska.

Wanted: Man qualified to handle estimating for medium sized reinforcing fabricator. Some detailing required. Outstanding opportunity to grow with company. In Phila. area. Starting salary $135.00 per week. P-1449, Engineering News-Record.

Small company in North Branch, N. J. requires young man or woman for general drafting work. Several years experience with fabricated metal desirable, but not necessary. Pleasant surroundings and congenial working conditions. Phone Randolph 5-3232, Extension 8 or write P-1435, Engineering News-Record.

Construction Engineer by General Contractor in Ohio and West Virginia. Permanent position and excellent opportunity. P-1481, Engineering News-Record.

Assistant Professor to teach civil engineering subjects in large eastern university in metropolitan area. Good salary for right man. P-1463, Engineering News-Record.

Civil Engineer, preference given to man with Illinois, County, Township or Federal Aid Secondary, survey, design or construction experience or equal. Position permanent, good working and living conditions. Give education, experience and salary expected. Hancock County Highway Department, Carthage, Illinois.

(Continued on page 130)

STRUCTURAL and MECHANICAL DESIGNERS

Having experience with heavy material handling equipment

Permanent Position For Qualified Men

HOSPITALIZATION
INSURANCE
VACATION

Phone or Write
Chief Engineer for interview

THE WELLMAN ENGINEERING CO.

7000 CENTRAL AVE.
Cleveland 4, Ohio
Telephone EN 1-0842

STRUCTURAL DETAILERS

Permanent positions for structural draftsmen having at least three years experience, with structural steel fabricators, on bridge and building work. Modern air-conditioned office with all employee benefits.

ST. JOSEPH STRUCTURAL STEEL CO.
Box 68, Station A St. Joseph, Mo.

Structural architectural engineer with steam electric and hydro-electric power plant experience to supervise structural steel design, prepare specifications, inquiries and purchase requisitions. Experience in other fields of engineering desirable.

STRUCTURAL ENGINEER

Position with large New York engineering and construction firm. Regular staff position with liberal company benefits. Salary commensurate with experience. Excellent opportunity for future advancement.

Please submit complete resume to:

P-1486, Engineering News-Record
330 W. 42 St., New York 36, N. Y.

SPECIFICATIONS WRITER

A leading international industrial engineering company has immediate opening available for an experienced building specification writer.

Applicants should possess at least five years experience writing building specifications for material purchases and subcontract specification for all building trades.

This is a permanent position offering good starting salary, all fringe benefits, good working conditions, high management cooperation, and opportunity for advancement.

Please submit a complete resume stating education, experience, salary requirement, and earliest date available to:

The H. K. FERGUSON COMPANY
ENGINEERS AND BUILDERS
1783 East 11th St., Cleveland 14, O.

PAY DIRT IS UP...

for engineers and draftsmen at Dresser-Ideco Company. Here, some of the world's tallest structures are being engineered and . . . like many Dresser-Ideco super-tall TV antenna towers . . . opportunities for Dresser-Ideco engineers and draftsmen are climbing, too. There may be a place for you on the Company's rapidly expanding engineering team with the potential for rapid advancement into management and development responsibilities.

WRITE:
E. L. SMITH
Dresser-Ideco Company
One of the Dresser Industries
875 Michigan Avenue
Columbus, Ohio

HYDRAULIC ENGINEER

New York consulting firm has opening for an engineer with sound basic knowledge of hydraulic principles. At least 15 years experience desired, preferably in the general field of electric power production or water supply. Work includes:

(1) **Office and field engineering for dams, spillways, flow lines and hydro-electric stations.**

(2) **Hydrological studies of surface and ground-water supplies.**

(3) **Field investigations of sites for steam electric and hydro-electric stations including preparation of preliminary economic comparisons.**

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P-1485, Engineering News-Record
330 W. 42 St., New York 36, N. Y.

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College graduates with minimum 6 years' work experience in industrial engineering, cost analysis or related activities. To provide industrial engineering services ranging in scope from shop layout to organizational changes in major oil producing operations.

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P-1433, Engineering News-Record
330 W. 42 St., New York 36, N. Y.

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P-1350, Engineering News-Record
330 W. 42 St., New York 36, N. Y.

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P-1273, Engineering News-Record
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Design experience in one or more of the following fields:
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PITTSBURGH-DES MOINES STEEL CO.
Fresno, California

POSITIONS VACANT

(Continued from page 127)

Petrographer: Experienced in mineralogical and petrographic examination of cement, concrete and concrete aggregates to work in laboratory of consulting engineers. Write fully regarding experience, education, date available and salary required. Midwest location. Permanent. P-1289, Engineering News-Record.

100 Civil Engineer Vacancies—The Michigan Civil Service Commission is currently recruiting to fill a large number of positions in the State Highway Department created by an expansion in the road construction program from $70 million in 1955 to $150 million in 1956. A comprehensive Engineer Trainee Program is offered to graduates of accredited engineering colleges. The program continues for 12 to 18 months including seven week assignments in each of the following: Bridge Construction, bridge design, road construction, road design, road surveys, maintenance, planning and traffic and testing and research (Soils). One hundred and ninety-one persons have entered this program in the last seven years. One hundred and thirty-two remain. The figures speak for themselves. Job opportunity, promotion, 40 hour work week, security, social security, state pension plan, vacation, sick leave and many other benefits generally available only under a progressive civil service system are yours when you work for the Michigan State Highway Department. Salary for the Engineer Trainee Program starts at $4600 plus $20 weekly expense allowance while on most training assignments with 6 months increases to $5200 in 18 months. First promotion brings salary range with maximum of $6800. Next promotion to project engineer carries salary at maximum of $8150. Write for application for Engineer Trainee I to Michigan Civil Service, Recruitment and Placement, Lansing 13, Michigan.

Wanted experienced Estimators on building construction and reinforced concrete work with well-established Massachusetts Contractor. Good opportunity. P-1498, Engineering News-Record.

Civil Engineer, 25 to 35, position with firm doing engineering and construction work. Salary $5,000 to $8,000 and bonus commensurate with experience. In reply state age, experience and salary expected. Southwest Engineering, Inc. Post Office Box 2033-Station D, Evansville, Indiana.

General Superintendent to assume complete charge of all field operations for building contractor located Twin Cities, Minnesota. Give age experience references and salary requirements. Top man only. P-1499, Engineering News-Record.

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Permanent Positions Depending on Ability
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To work with long-established sanitary engineering consulting firm in New York City. Life insurance and other benefits. Salaries open.

P-1443, Engineering News-Record
330 W. 42 St., New York 36, N. Y.

POSITIONS VACANT

Estimator well established company doing business in industrial commercial and institutional construction solicits inquiries from experienced estimators. Location-Twin Cities, Minnesota. Give age experience references and salary requirements. P-1501, Engineering News-Record.

Engineers Civil, Hydraulic, Soils or Dam broad experience available in planning, design and construction of flood control projects in State of Pennsylvania. Work includes broad phase of hydraulics, hydrology, soil mechanics and reinforced concrete design. Salary from $4524 to $6294 per annum depending on experience and qualifications. Chief, Design Branch responsible for supervision of engineering design groups engaged in design of flood control projects. Applicants must have experience in the design of flood protection projects and be familiar with hydraulics, soil mechanics and concrete design. Salary commensurate with experience. Fringe benefits including liberal promotion policy, vacation, sick and holiday leave benefits and retirement system. State education, experience, age, salary expected and references. P-1510, Engineering News-Record, 330 W. 42nd Street, New York 36, New York.

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Qualified distributor wanted for steel form work, (wall, suspended, flexible, and arch), scaffolding, jacks, shores and road forms. RW-1471, Engineering News-Record.

POSITIONS WANTED

Experienced building estimator, 30, married. 9 years experience with one contractor. Proven performance record in bidding, purchasing and job management. Includes 2½ years as project manager on two multi-million dollar projects. Desires responsible position with opportunity to advance with general contractor. PW-1416, Engineering News-Record.

Construction Supt. available for large project or several small ones. Prefer Georgia, Florida or West Indies. G.M.C. Lucas 2225 Wisteria St., Sarasota, Florida.

Chief Structural Engineer buildings—single and multiastory foundations, civil and waterfront work location New York City. PW-1425, Engineering News-Record.

Construction Supt. or Assit. Supt. Experienced in heavy construction, sheeting, shoreing, underpining, foundation work. Concrete and excavation, utilities. PW-1448, Engineering News-Record.

Construction Supervisor, age 36, graduate engineer, excellent experience in heavy construction including management and engineering phases, desires connection in Rocky Mt. or Southwest area with moderate size construction organization having growth possibilities. Can consider opportunities requiring financial participation. PW-1445, Engineering News-Record.

Building Construction Superintendent. 25 years experience supervising large building project specializing in Public schools and also in industrial plants. PW-1496, Engineering News-Record.

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Mechanical engineer, P.E., age 34, aggressive, with determination to get results, seeks position with opportunity and challenge. 12 years of diversified experience in plant layout, design development, plant electronics, methods, cost reduction, quality control, technical procurement and maintenance of production machinery and building facilities. Excellent background in handling technical personnel, coordination of production departments and production control.

PW-1533 Engineering News-Record
330 W. 42 St. New York 36, N. Y.

POSITIONS WANTED

Construction Superintendent and engineer desires work in New England. Experienced industrial, building, marine and heavy construction, housing, road structures and drainage. PW-1325, Engineering News-Record.

Civil Engineer, M.S., Reg. Pa., 35. Five years designer on procedure and equipment for large steel erector, 2 years pile foundation construction. Desires contractor or engineering office with opportunity to broaden experience and responsibility. PW-1327, Engineering News-Record.

Executive engineer, heavy construction BSCE. Experience: more than 20 years, most recent on oil pipe line, pumps, tanks, and tanker pier. Past includes major airbase buildings, powerplants, utilities, grading and paving. Also piers, cofferdams, caissons, prestressed concrete, highways and railroad. U. S. and overseas. Fluent Spanish and French. Available 15 May. PW-1516, Engineering News-Record.

Construction superintendent engineer. Registered Civil 55. Wide experience all phases industrial, heavy construction, water supply, sanitation, tunnel, bridge developments. Capable assuming full responsibilities entire construction program. PW-1514, Engineering News-Record.

Professional Engineer—M.S.-Registered C.E. Calif.—experience: 3 yrs. engineering teaching; 2 yrs hydraulics & hydro-electric; 3 yrs oil refineries. Desires Foreign assignment. PW-1515, Engineering News-Record.

PART TIME WORK WANTED

Part Time Work: Retired hydraulic & sanitary engineer available for hydrologic studies & computations concerning water use. N. Y. Metropol. area. PTWW-1517, Engineering News-Record.

SELLING OPPORTUNITY WANTED

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Will consider
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Owner will sell complete organization as listed for the amount that the business earned in net profit last year. The firm is located in a large and growing southeastern city. The amount of work performed can be greatly expanded if new owner so desires.

Write
BO-1438, Engineering News-Record
330 W. 42 St., New York 36, N. Y.

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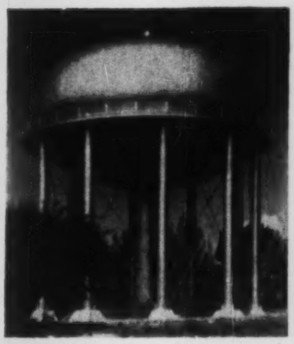

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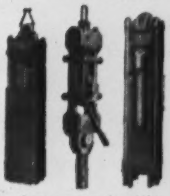

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Editorials

To Get the Schools We Need

Stick First to the Essentials

The school shortage has been brought back into the limelight by the report to the President of the Committee for the White House Conference on Education. There will be wide acceptance of the committee's basic proposals: that school systems be organized to improve efficiency of operation and financing, that better surveys be made of school needs, that greater inducements be offered to attract and retain good teachers and that interest and activity of all citizens in school affairs be encouraged. Some of the other recommendations, however, will not find such ready agreement.

For example, since local funds are limited, the committee proposed that school boards pursue a policy of giving children first things first. The intent is to insure that "in the rush for a great quantity of courses, quality must not be lost." In this same connection the committee might have recommended; but didn't, that the first things first idea be applied also to school plant. Instead, the committee suggested that account be taken of "the great variety of facilities people want in a school building in addition to classrooms." This may be fine for communities that can afford it. But where funds are short, classrooms should come first, then the other facilities such as auditoriums, laboratories, gymnasiums, swimming pools and music rooms.

The committee also recommends that every community and every state do all that is economically possible to construct the buildings required. This should be a fundamental policy throughout the nation, otherwise there can be no hope of eliminating the school shortage. But the committee then added that during the present emergency, federal funds should also be used "wherever shown to be necessary." Are these two recommendations consistent?

Studies made to date by the U. S. Office of Education indicate a big deficit in many states between the funds needed for new school plant and what the states say they can raise. Offhand, this would indicate that federal aid is necessary in most states. However, closer study shows that many of the richest states in the country report the biggest deficits, and many are spending a relatively small percentage of their income on schools. They could spend much more. The real problem is how to provide necessary federal aid without destroying the incentive of states and communities to do their utmost on their own and to insure that federal money is used as efficiently as possible.

While reports from Washington indicate that the chances of federal aid for schools appear better now than ever, there are few communities that will find it advantageous to wait for it. School enrollments are climbing, and meanwhile construction costs, after an 18-month period of stability, have turned up. If the school shortage is to be overcome, communities should build right away, build only the essentials first and build economically (see p. 37).

To Judge Construction's Future

Keep an Eye on the Money Market

Borrowed money is a prime ingredient of construction. What it costs, therefore, can have a lot to do with construction prospects. And as of now, the cost of renting money for construction—measured by interest rates—is at a new high. More important, it is going higher, so the effect on construction will bear watching.

That interest rates on all kinds of borrowing—bank loans, mortgages or bonds—are going up was foretold last week when the Federal Reserve banks raised their discount rates. This means that commercial banks will have to pay the Federal Reserve more for their borrowings, and consequently will have to charge their borrowers more for the money loaned them. With bank loans commanding more interest, mortgage lenders will ask a comparable return, and so will the purchasers of bonds. In our competitive money market such a chain reaction is inevitable.

Why did the Federal Reserve choose to make money more costly? The motivation obviously was to counter inflationary tendencies, and the reason apparently was the fact that the volume of loan applications on bankers' desks had reached unprecedented proportions. The hope is that higher interest rates will frighten some of the borrowers away, or at least make the bankers more selective in their loans. In either case less money would be loaned, and consequently the demand for all types of goods would be eased, thus reducing inflation pressures.

What will be the effect on construction? If the money managers' hopes are realized, less money will be borrowed. In such case, some proposed construction projects would not go ahead, but this could be more healthy than runaway costs, which in the end would also cut construction.

Actually any housing slump would probably be corrected by liberalizing FHA and VA requirements. Industrial building should not be too much affected by higher interest rates since so much of this financing is done with company funds rather than bonds. The effect on work, private or public, financed by bonds is more difficult to assess.

On balance perhaps, present changes in interest rates do not pose a threat to construction's immediate future. Still borrowed funds are so important to construction that it is always wise to keep an eye on the money market.

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CHRYSLER *INDUSTRIAL ENGINES* / HORSEPOWER WITH A PEDIGREE

TIMKEN® bearings cut lubrication checks from once a day to once a month

THIS Cleveland trencher's track rollers used to demand a daily oil check. Now, with Timken® bearings, one check a month is plenty. One reason: because of their high accuracy, Timken bearings keep housings and shafts concentric, allow the use of a more effective lubricant seal. The tapered construction of Timken bearings prevents end play in the track rollers, eliminates pumping action which would pull dirt in, force oil out.

Timken bearings practically eliminate friction in the trencher's rollers. Their geometrically correct design and precision manufacture give them a true rolling motion. They normally last the life of the machine because they're engineered for the job and made of Timken fine alloy steel.

This "240" model trencher can dig a ditch 3′ wide and 6′ 3″ deep at 12 lineal feet a minute along wet right-of-way or up sloping hills. To take the combined radial and thrust loads, 68 Timken bearings were specified for the crawlers, transmission and front upper truck. Because of their tapered design, Timken bearings take radial and thrust loads in any combination, hold shafts in rigid, positive alignment, assure smooth gear meshing under sudden starts and stops.

Always specify Timken tapered roller bearings when you buy or build machines. Look for the trade-mark "Timken" on the bearings. The Timken Roller Bearing Company, Canton 6, Ohio. Canadian office: St. Thomas, Ont. Cable address: "TIMROSCO".

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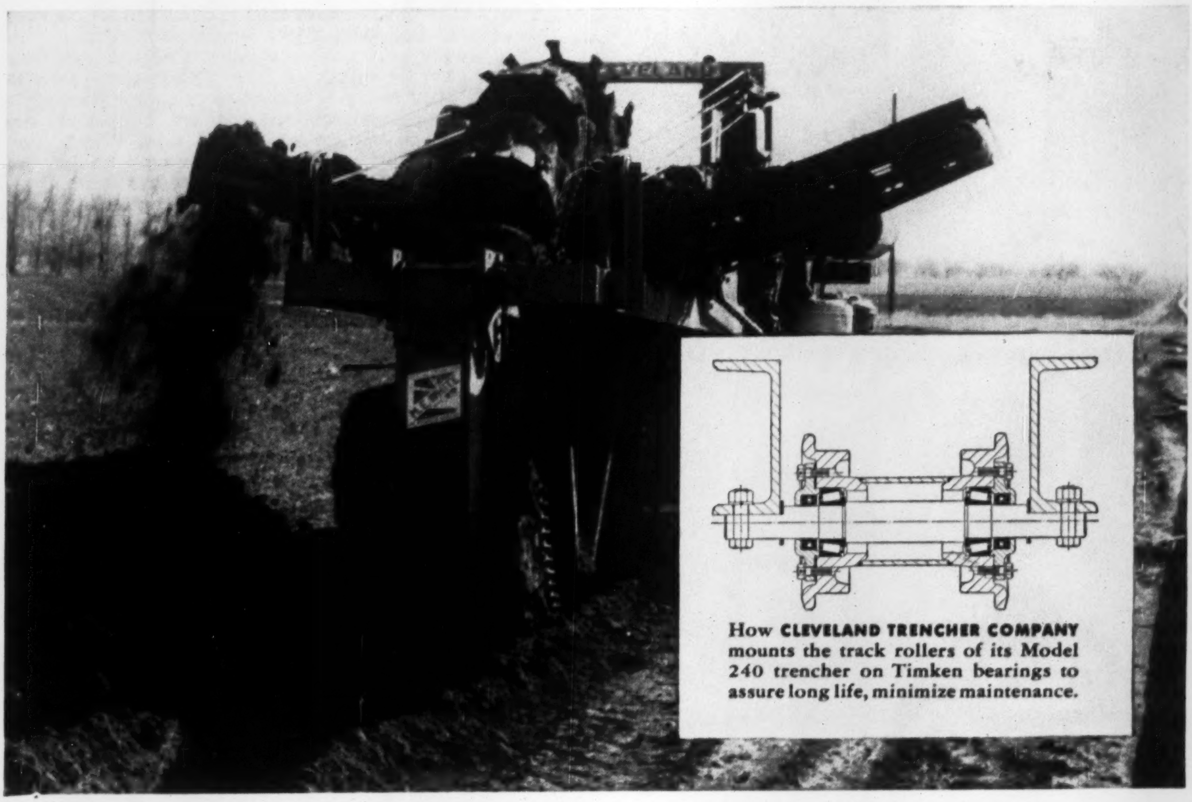

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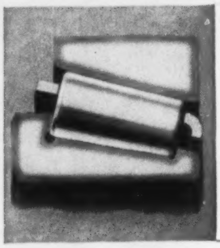

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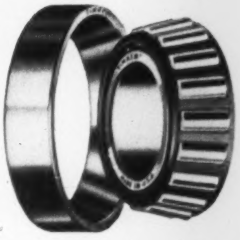

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